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ABSTRACT

This module (part of a series of 24 modules) is on formulating educational goals and objectives, and methods and rationale for writing them as behavioral statements. The genesis of these materials is in the 10 "clusters of capabilities," outlined in the paper, "A Common Body of Practice for Teachers: The Challenge of Public Law 94-142 to Teacher Education." These clusters form the proposed core of professional knowledge needed by teachers in the future. The module is to be used by teacher educators to reexamine and enhance their current practice in preparing classroom teachers to work competently and comfortably with children who have a wide range of individual needs. The module includes objectives, scales for assessing the degree to which the identified knowledge and practices are prevalent in an existing teacher education program, and self-assessment test items. Bibliographic references and journal articles on developing goals and objectives for educational programs are included. (JD)

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DEVELOPING GOALS AND OBJECTIVES FOR EDUCATIONAL PROGRAMS

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Extending the Challenge:

Working Toward a Common Body of Practice for Teachers

Concerned educators have always wrestled with issues of excellence and professional development. It is argued, in the paper "A Common Body of Practice for Teachers: The Challenge of Public Law 94-142 to Teacher Education,"* that the Education for All Handicapped Children Act of 1975 provides the necessary impetus for a concerted reexamination of teacher education. Further, it is argued that this reexamination should enhance the process of establishing a body of knowledge common to the members of the teaching profession. The paper continues, then, by outlining clusters of capabilities that may be included in the common body of knowledge. These clusters of capabilities provide the basis for the following materials.

The materials are oriented toward assessment and development. First, the various components, rating scales, self-assessments, sets of objectives, and respective rationale and knowledge bases are designed to enable teacher educators to assess current practice relative to the knowledge, skills, and commitments outlined in the aforementioned paper. The assessment is conducted not necessarily to determine the worthiness of a program or practice, but rather to reexamine current practice in order to articulate essential common elements of teacher education. In effect then, the "challenge" paper and the ensuing materials incite further discussion regarding a common body of practice for teachers.

Second and closely aligned to assessment is the development perspective offered by these materials. The assessment process allows the

*Published by the American Association of Colleges for Teacher Education, Washington, D. C., 1980 ($5.50).

user to view current practice on a developmental continuum. Therefore, desired or more appropriate practice is readily identifiable. On another, perhaps more important dimension, the "challenge" paper and these materials focus discussion on preservice teacher education. In making decisions regarding a common body of practice it is essential that specific knowledge, skill and commitment be acquired at the preservice level. It is essential that other additional specific knowledge, skill, and commitment be acquired as a teacher is inducted into the profession and matures with years of experience. Differentiating among these levels of professional development is paramount. These materials can be used in forums in which focused discussion will explicate better the necessary elements of preservice teacher education. This explication will then allow more productive discourse on the necessary capabilities of beginning teachers and the necessary capabilities of experienced teachers.

In brief, this work is an effort to capitalize on the creative ferment of the teaching profession in striving toward excellence and professional development. The work is to be viewed as evolutionary and formative. Contributions from our colleagues are heartily welcomed.

This paper presents one module in a series of resource materials which are designed for use by teacher educators. The genesis of these materials is in the ten "clusters of capabilities," outlined in the paper, "A Common Body of Practice for Teachers: The Challenge of Public Law 94-142 to Teacher Education," which form the proposed core of professional knowledge needed by professional teachers who will practice in the world of tomorrow. The resource materials are to be used by teacher educators to reexamine and enhance their current practice in preparing classroom teachers to work competently and comfortably with children who have a wide range of individual needs. Each module provides further elaboration of a specified "cluster of capabilities" - in this case, developing goals and objectives for educational programs.

DEVELOPING GOALS AND OBJECTIVES FOR EDUCATIONAL PROGRAMS

Clearly written, justifiable goals and objectives and procedures for evaluating goal attainment are potentially key factors to successful educational programs. Recognition of this potential is evident in the Education for All Handicapped Children Act (94-142, 1975) which mandates that representatives of the local educational agency develop an Individualized Educational Program (IEP) for each handicapped child that includes annual goals and short-term objectives and appropriate objective criteria, evaluation procedures, and schedules for determining whether instructional objectives are being achieved. Additionally, one can reasonably expect classroom teachers to formulate goals and objectives to guide the instruction of all children in their class. Nevertheless, research (Tymitz, 1981) suggests that teachers perceive themselves to be inadequate in writing useful, correct goals and objectives, and that indeed, the actual goals and objectives that they write are inadequate. More specifically, teachers are unsure about the number of objectives required for each goal, the relationship between goals and objectives, appropriate sequences for objectives, correct scopes for goals, the difference between classroom activities and instructional objectives, and the congruency and compatibility of goals and objectives with the abilities and skills of specific children. Regular classroom teachers scored especially low on a profile task of goal-related skills, and they reported a lack of pre- and inservice training for skills in goal and objective development (Tymitz, 1981). These regular classroom teachers appear to require comprehensive training if they are to participate meaningfully in the planning of individualized educational programs.

Therefore, the purpose of this module is to discuss the development of goals and objectives. The module proceeds from the general to the specific. After a history and rationale for the importance of goals is presented, the paper develops a set of general principles for creating effective goals and objectives from relevant research and theory. Then, the module describes procedures for formulating valid goals and for developing valid objectives, and it closes with a discussion of methods and rationale for writing goals and objectives as behavioral statements.

Other modules in the total set that are related to the topic include:

Individualized Teaching: Writing Individualized Education Programs.

Curriculum Based Assessment.

Formal Observation of Students Social Behavior.

Contents

Within this module are the following components:

Page

Set of Objectives - The objectives focus on the teacher educator and on the preservice teachers. They identify behaviors that can be expected as a result of working through the materials. They are statements about skills, knowledge, and attitudes, which should be part of the "common body of practice" of all teachers. 4

Rating Scales - A scale is included by which a teacher educator could, in a cursory way, assess the degree to which the knowledge and practices identified in this module are prevalent in the existing teacher-training programs. The rating scales also provide a catalyst for further thinking in each area. 6

Self-Assessment - Specific test items were developed to determine a user's working knowledge of the major concepts and principles in each subtopic. The self-assessment may be used as a pre-assessment to determine whether one would find it worthwhile to go through the module or to check one's knowledge after the materials have been worked through. The self-assessment items also can serve as examples of mastery test questions for students. 7

Rationale and Knowledge Base - The section describes a history of and rationale for goal writing, as well as summarizes procedures for writing valid, behavioral goals and objectives. Review questions are included through the text for readers to assess their understanding of the material. 13

Bibliography - A partial bibliography of useful books and materials is included after the list of references. 56

Articles - Four articles (reproduced with the authors' permission) accompany the aforementioned components. The articles support and expand the knowledge base. 57

Objectives for Teacher Educators and for Incorporation into Teacher Education Curricula

Upon completion of this module, the reader should:

1. Know the history of, a rationale for, and the purpose for the development of goals and objectives in students' programs.
2. Be familiar with the research supporting and shaping the use of goals and objectives in education.
3. Be able to identify principles for writing useful goals and objectives.
4. Be able to distinguish between student- and teacher-oriented goals, process- and product-oriented goals, and content-related and content-divorced goals and objectives.
5. Be able to formulate valid goals.
6. Be able to formulate valid objectives.
7. Understand relationships between goals and objectives.
8. Be able to apply task analysis and skill sequences in developing objectives.
9. Be able to write behavioral goals and objectives.
10. Understand the importance of monitoring progress towards goals and ojbectives.

Reasonable Objectives for a Teacher Education Program

All students should have well-structured knowledge, practical skill, and commitments to professional performance in the following areas:

1. Writing, justifying, and using educational goals for individuals and groups.

2. Writing and using instructional objectives derived from justifiable educational goals.
3. Communicating and justifying goals and objectives to parents, students, and other professionals.
4. Developing and using goal-based and objectives-based evaluation procedures.
5. Clearly and effectively summarizing data on the degree to which goals and objectives have been attained.

Rating Scale for Teacher Preparation Programs

Check the statement that best describes the level of your present teacher-education program on the topic of developing goals and objectives for IEPs.

_____ 1. Students being prepared for teaching have not been introduced to a rationale or procedures for developing educational goals and objectives.

_____ 2. Students being prepared for teaching have been introduced to a general rationale for developing educational goals and objectives, but they lack systematically organized knowledge concerning techniques for writing goals and objectives.

_____ 3. Students being prepared for teaching have been introduced to a general rationale and procedures for developing goals and objectives, but they lack practice in writing goals and objectives.

_____ 4. Students being prepared for teaching have limited practice in writing goals and objectives for classroom activities. They have no experience in writing or using individualized goals and objectives.

_____ 5. Students in preparation for teaching have clear knowledge and well developed practical skill in writing and using valid, behavioral goals and objectives for both individuals and groups of students.

Self-Assessment

1. Two psychological principles that provide a rationale for writing educational goals are:
   a.

   b.

2. In what way has the use of educational goals and objectives developed in the past century?

3. What is a reason that goals and objectives were included in the IEP component of 94-142?

4. Three purposes for goals and objectives are:
   a.

   b.

   c.

5. From the statements provided below, check those that describe well-written, useful goals and objectives.
   ____ a. statements of course content
   ____ b. detail learning processes
   ____ c. related closely to program content
   ____ d. related variably to program content
   ____ e. student-centered
   ____ f. general statements of student abilities
   ____ g. teacher-centered

____ h. statements of learning products
____ i. primarily useful in directing teacher behavior
____ j. primarily useful in directing evaluation
____ k. primarily useful in guiding student effort

5. Distinguish between learning processes and products.

7. Order the following list of steps in formulating valid goals. You can assign the same number to more than one step if the steps occur at the same time.

____ determining a reasonable but ambitious segment of growth
____ listing types of learning outcomes within a domain
____ consulting taxonomies of objectives
____ consulting with colleagues to identify school- or program-wide goals
____ identifying goal behaviors or verbs
____ observing students in less restrictive settings
____ assessing students' current performance levels
____ deciding on high priority goal areas for adaptive functioning in relevant settings

8. Discuss the relationship between goals and objectives.

9. Task analyze the behavior, "Given the numbers one to 10, each number printed on a block with the blocks in random order, sequence the blocks from left to right, from one to 10."

10. Complete the blanks in the following definition.
Skill sequences are _____ of behaviors which progress from _____ to _____ functioning in major _____.

11. What is the difference between the task analytic and the skills sequencing view on the relationship between goals and objectives?

12. According to Mager (1975), three components of a behavioral objective are:
a.

b.

c.

13. Circle overt verbs from those listed below

wash	comprehend	identify
understand	see	appreciate
draw	recognize	attend
run	match	summarize

14. Given the following objectives, check those that are complete. For the incomplete objectives, indicate what is missing.

    a. The student will write the alphabet in sequence with 100% accuracy.

    _____

    b. The student will recognize the use of pronouns in simple sentences.

    _____

    c. Given ten CVC words sampling all vowels, the student will read the words orally.

    _____

    d. Given 10 1-digit tc 1-digit addition problems without regrouping, the student will write answers with 90% accuracy.

    _____

15. Describe a measurement procedure for the following objective. "Dictated vocabulary words in Ginn Level 5, May I Come In, the student will write words with 90% of words spelled correctly."

Answer Key

1. a. Behaviors tend to be goal oriented.
   b. Behavior or stimuli that arouse goal-directed behavior become increasingly complex.

2. from general to specific
   from few to many
   from group-oriented to individually-oriented

3. To insure that schools are accountable for the quality of services they provide to students.

4. a. to guide students' learning
   b. to direct teachers' instruction and curriculum development
   c. to structure the evaluation of student progress

5. d, e, h

6. Learning processes are the instructional procedures and curriculum employed by teachers. Learning products are the behavioral outcomes expected of students.

7. 3
   7
   4
   4
   8
   4
   1
   2

8. See "Formulating valid objectives."

9. See "Formulating valid objectives" for procedure.

10. hierarchies
    zero level
    competent
    developmental areas

11. See "Formulating valid objectives."

12. conditions
    performance
    criteria

13. wash match
    draw identify
    run summarize

14. a. condition
    b. condition, overt verb, criterion
    c. criterion
    d.

15. Sample response:
    Randomly sample 20 words from May I Come In. Tell the student to spell the words on paper as you dictate them. Dictate the words to the student, who is provided with paper and pencil. Score the response. If at least 18 are spelled correctly, the student has mastered the objective.

DEVELOPING GOALS AND OBJECTIVES FOR EDUCATIONAL PROGRAMS

History and Rationale

The importance of goals in understanding human behavior is critical. Consider the following behavioral sequences: (1) A baby awakens and cries vigorously. His mother picks him up and feeds him. (2) A seven year old plays contentedly with his toys until his brother enters with a new model airplane. Then, the seven year old quits his play and explains to his mother why he, too, needs a new toy. (3) A high school graduate works hard during summers and evenings and she lives in substandard fashion in order to finance her way through college and professional school. These behavioral sequences illustrate an important psychological principle. That is, behaviors tend to be goal oriented; intent is fundamental to all organized mental activities and human endeavor (Farnham-Diggory, 1972). These behavioral examples also demonstrate the principle that as an individual develops, behavior as well as the stimuli that arouse goal-directed behavior become increasingly complex (Goodenough, 1945). In the case of the infant, basic physiological need stimulated crying; in the two other examples, more complicated sets of conditions stimulated more elaborate behaviors. At an even more complex level, successful adulthood can be defined as the integration and striving for internally consistent, prosocial goals (Goodenough, 1945). Therefore, as the organism develops, current levels of performance change, and these changes, in turn, dictate appropriate goals.

Each person organizes his/her activities around a set of goals that relates to his/her current performance and levels of aspiration (Ahmann & Glock, 1967; Farnham-Diggory, 1972). The nature of one's goals and his/her daily strivings typically are inextricably intertwined. In a similar way,

schools are organized around sets of goals, and the nature of those goals and the curricula of schools are intimately connected. Historically, the primary goals in public education are those of Americanizing and instilling democratic values in youth (Mulhern, 1959). More recently, however, the goals and objectives of school curricula have become more distinct, specific, and numerous, and they have become focused more narrowly on individuals' current performance levels.

In schools, today, educational goals and objectives are meaningful, unambiguous statements of intended learning outcomes (Bloom, Hastings, & Madaus, 1971). The belief in the usefulness of developing clear and specific educational objectives emerged near the turn of the century. Prior to this time, psychologists viewed the brain as a composite of general intellectual faculties that, when strengthened, could be applied to any area of human activity (Eisner, 1967). So, if educators identified faculties and strengthened them, then one would expect concurrent general educational growth.

At the turn of the century, however, Thornkike demonstrated the specificity of transfer, wherein transfer of learning occurs when elements in the original learning content are relevant and similar to elements in other contexts (Eisner, 1967). Applying Thorndike's work to the development of educational curricula, Bobbitt (1918) argued that human life consists of the performance of specific activities and that the "numerous, definite, and particularized" skills and knowledge required for successful adult life should constitute the curriculum of schools.

Therefore, psychologists began to develop the notion that general intellectual growth might be operationalized into series of specific learning products. This premise was central to Ralph Tyler's work in curriculum and instruction. Tyler viewed evaluation as the determination of the ways and extent to which

students have changed in relation to a set of desired outcome behaviors. While in charge of the eight-year study of secondary education for the Progressive Education Association, Tyler emphasized successfully the need to define educational objectives in terms of student behaviors and specific content. A product of that study was Smith and Tyler's book Appraising and Recording Student Progress (1942), which lists numerous behavioral objectives. Furthermore, in his role as director of the National Assessment Project, Tyler required that educational objectives constitute the groundwork for developing curriculum materials and instructional procedures and in designing evaluation instruments to appraise the effectiveness of these newly developed materials and procedures (Bloom et al., 1971).

Psychologists like Gagne, Glaser, and Mager also were interested in developing clear statements of educational objectives. In contrast to Tyler, however, these investigators were interested primarily in the development of effective instructional units rather than in summative evaluation. Their focus was on task analysis, the description of a behavioral outcome in terms of "a repertoire of behavior structure that must be sequentially built up to arrive at the terminal performance" (Bloom et al., 1971, p. 26). The work of Gagne and others served to develop further the notion that school-related growth could be operationalized and segmented into very small units.

Perhaps one of the major impacts of the use of distinct behavioral objectives in schools was to render local educational agencies more accountable to the public for the content and effectiveness of their programs. Similarly, in special education, accountability was one of the important rationales for mandating the development of IEPs, which include annual goals and short-term objectives. In its findings of facts in PL 94-142, Congress focused on individualized education, stating that the special education needs of handicapped children were not being

met fully (Turnbull & Turnbull, 1978). Integrative reviews of the efficacy of special education programs (Dunn, 1968; Glass, 1981) corroborate Congress' findings; they revealed that special needs programs were ineffective in promoting student growth. Developers of P.L. 94-142 intended that the IEP statement of goals and objectives along with procedures and criteria for determining whether goals and objectives are being met would assure that schools were accountable to students, parents, and taxpayers for the quality of the programs they provide to handicapped pupils (Turnbull & Turnbull, 1978).

Besides fostering accountability, there are three purposes for developing educational goals and objectives: (a) to direct teaching and curriculum development, (b) to guide learners, and (c) to structure evaluation. The following discussion briefly summarizes research relating to each of the three purposes for developing goals and objectives.

Directing teaching and curriculum development. Studies indicate that teaching with objectives may relate to student academic growth and teacher success. McNeil (1967) randomly assigned 77 university students to two groups. These students were placed in classrooms for two days. In the experimental group training teachers contracted with cooperating teachers concerning what student behavioral changes would constitute success; in the control group, practicing teachers familiarized themselves with class activities and prepared daily lesson plans. Both supervisors and cooperating teachers judged the experimental trainees as achieving greater success in teaching as evidenced by pupil achievement and as evidenced in the trainees' application of principles of learning. In a second experiment (McNeil, 1967), student teachers were assigned randomly to groups, where the controls were advised that their student teaching grades would be determined by their "professional characteristics and

teaching methods," and experiemntals were told their grades would depend on the appropriateness of the behavioral objectives they selected and on student mastery of objectives. Results revealed that children in the experimental group achieved significantly more in the relevant domain than children in the control group.

Additional research (Baker, 1969; McNeil, 1967; Wittrock, 1962) corroborates these findings that teaching with objectives relates to teacher success and student achievement. It appears, then. that behavioral goals and objectives may be effective in directing teaching and curriculum development.

Guiding learners. Some industrial and social psychological studies of individual and group goals suggest that an individual functions better when clear about expected goals (Mager & McCann, 1962; Raven, 1959). Learning theory (Crow & Crow, 1963; Farnham-Diggory, 1972) supports the notion that it is important that a learner be aware of the goals towards which he/she is striving. Such understanding, theoretically, helps the learner recognize errors and improve his/her performance, and this power to discriminate among responses affects the attainment of skills.

A substantial number of studies of researchers, such as Blaney and McKie (1969), Wales (1970), and Schuck (1969), has documented that student knowledge of behavioral objectives enhances learning. Although some data suggest that the availability of behavioral objectives does not improve learning, no study suggests that such knowledge depresses student achievement. It appears that behavioral goals and objectives can enhance learning, and that certain variables may determine what type of behavioral objectives positively affects student achievement. These findings are reviewed below under "Writing Useful Goals and Objectives."

Structuring evaluation. One of the primary impeti for the proliferation of behavioral objectives in education was to structure the evaluation process.

Behavioral objectives seem implicitly valuable for this task, because once a behavioral objective has been formulated, it structures, at least partially, the methods for criterion-referenced assessment and evaluation. Furthermore, research, however scant, appears to corroborate their utility in evaluation (Bowers, 1980; Briggs, Stoker, & Scanlon, and Griffin, cited in Duchastel & Merrill, 1973).

In summary, research tends to support the use of goals and objectives to guide the learner as well as to structure both instruction and the evaluation of educational programs. Additionally, learning theory, psychological principles, and the accountability movement in the schools contributed to the proliferation of the use of explicit, distinct behavioral objectives in education today.

REVIEW QUESTIONS

1. Name two principles of developmental psychology that provide a context for goal setting in education.

   a. _____

   _____

   b. _____

   _____

2. Describe briefly how the statement of educational goals has changed.

   _____

   _____

   _____

3. What is the difference between Tyler's and Gagne's use of behavioral objectives?

   _____

   _____

   _____

4. How does 94-142 attempt to assure accountability for the effectiveness of programs provided to handicapped pupils?

   _____

   _____

   _____

5. Besides fostering accountability, what are 3 purposes for developing educational goals and objectives?

   a. _____

   _____

   b. _____

   _____

   c. _____

   _____

Writing Useful Goals and Objectives

To illustrate simply the potential usefulness of setting goals and objectives, Lynch, McGrugan, and Shoemaker (1979) employed the following analogy:

> Suppose you are taking a trip. Contrast the difference between taking that trip having specified your destination and taking the trip with no special endpoint in mind. For example, you leave Seattle this morning with a goal to reach Mexico City by nightfall three days hence, as opposed merely to leaving Seattle. Without a specified destination and projected arrival time, you know neither in which direction to go nor how fast to travel; having established a goal, you know both these facts (head south and really hustle). With this information you can judge whether the direction and the rate at which you are travelling will get you to your final destination on time.

The likelihood of reaching your destination depends largely on how well you map where you are, where you want to go, and when you want to get there. In teaching, assessment of current performance levels tells you where you are. Goals and objectives identify where you are going and when you plan to arrive. With these pieces of information carefully delineated, one is more likely to effect student achievement (Mirkin, Deno, Fuchs, Wesson, Tindal, Marston, & Kuehnle, 1981).

But what are some elements of a useful educational goal or objective? To illustrate clearly effective goals and objectives, this discussion begins with a description of what helpful objectives are not.

What goals and objectives should not be. Effective goals and objectives are not the following:

1) They are not teacher-centered. In useful goals and objectives, the verb does not describe teacher activities. Statements of teachers'

plans are helpful only after the question is answered concerning why such actions are important. Education is a systematic process of helping learners change. Consequently, pupil outcomes should be the primary focus for direction and evaluation of instruction and for goals and objectives (Bloom et al., 1971). A useful objective, then, is not: "Consonant-vowel-consonant phonemic patterns will be introduced using a feltboard and sand tray; correct responses will be modeled."

The relationship between teacher- and student-centered goals is analogous to the difference between learning processes and learning products. Gronlund (1968, p. 21) employs the following diagram to illustrate this point:

Pupil	Learning Experiences (Process)	Learning Outcomes (Product)
	Study of cell structure of plants in laboratory	Knowledge of cell parts Microscope skills Skills in writing accurate reports of scientific observations

As discussed by Gronlund, this diagram clarifies several points. First, objectives establish direction or pupil growth. Second, the learning product may or may not be related closely to learning processes. In this case, microscope and reporting skills might have been developed with different learning experiences, while knowledge of cell parts is connected intimately with this specific learning experience. Finally, this illustration demonstrates that goals and objectives can vary in difficulty level. There, "knowledge of parts of cells" is relatively easy to develop and to measure mastery of, whereas "ability to write scientific reports" is more difficult to foster and requires more elaborate, varied measurement procedures (Gronlund, 1968).

2) Related to the fact that goals and objectives ought not be teacher-centered is the notion that they also should not be details of content to be covered (Mager, 1975). When objectives describe course content, then those objectives are met when the content has been presented regardless of whether students change in any intended ways. For instance, "Brazil," "the laws of gravity," and "Macbeth" constitute course contents, not objectives. Similarly, "to introduce general psychology, with emphasis on laboratory work" is a course description, not a course objective.

3) While some objectives overemphasize course content, others state student behavior without any reference to course content. Goals and objectives are not divorced from content (Bloom et al., 1971). Statements such as "develop critical thinking skills," or "increase student's ability to make references" are too general to provide guidance in planning instruction or evaluation. Critical-thinking and inference-making skills, for example, differ from discipline to discipline.

In light both of the preceding paragraphs and of the findings presented below, several principles for writing acceptable goals and objectives emerge. These principles are presented in the following section.

General principles for writing acceptable goals and objectives. The preceding discussion reveals the first two principles for writing acceptable goals and objectives:

Principle 1: Goals and objectives are student-centered; they describe student behaviors.

Principle 2: Goals and objectives state student behaviors with some reference to instructional content.

The remaining principles emerge from the research and the learning and measurement theory described below.

Research (Melton, 1978) demonstrates that behavioral objectives can enhance learning, but that they do so when certain conditions are maintained. Tosi and Carroll (1976) found that the more clear goals are, the more likely participants are to attempt to meet them. Dales (1970) also underscored the importance of clear objectives when he demonstrated that performance of students was significantly better when students were provided with precisely rather than vaguely stated behavioral objectives. This finding corroborates learning (Crow & Crow, 1963) and measurement (Gronlund, 1968) theorists' positions that clear objectives provide more useful information both to learners for discriminating correct performances and to teachers for structuring instruction and evaluation. It appears, then, that precise goals and objectives are most informative and structuring for teachers and learners and that such goals and objectives maximize student achievement and teacher success. From this, Principle 3 emerges.

Principle 3: Goals and objectives are precise statements; they are clear to both students and teachers.

Brown (1970) has suggested that goals and objectives must be neither extremely easy nor very difficult for students in order to affect learning. This position appears logical, because very difficult or easy objectives would be immediately irrelevant and fail to affect the behavior of either student or teacher. Farnham-Diggory (1972) develops this line of thought. She states that the intensity with which individuals pursue goals is influenced by the clarity of one's understanding of how they may be achieved. Prentice (1961) says, ". . . goals seem to be enhanced by the opportunity to see graded series of achievements. . . ."; thus, goals within an individual's reach may contribute to goal achievement and related learning. From this, Principle 4 is gleaned.

Principle 4: Goals and objectives relate closely to students' current performance levels; statements of student outcomes are neither extremely easy nor extremely difficult.

In a series of experiments, Rothkopf and Kaplan (1972) investigated the relation between the density of text, the specificity of objectives, and student growth. They found that the probability of achieving any one objective decreased as the number of objectives increased, but that overall student achievement increased as the number of objectives increased. Measurement and learning theorists have debated the issue of what represents a manageable but meaningful number of student objectives, and how general or specific goals need be. Often, conclusions, such as "They should be large enough to organize the outcomes of instruction into logical categories and specific enough to indicate the behavior changes expected in pupils" (Gronlund, 1968, p.22) are difficult to comprehend and operationalize. The authors offer the following view on the specificity of goals and objectives in Principle 5.

> Principle 5: Goals and objectives describe the generalizable behavior sought in the student; they reflect, only in a limited way, the learning experiences planned for the student throughout the course of the year.

REVIEW QUESTIONS

1. Differentiate between teacher- and student-centered goals and between the processes and products of instruction. How does this relate the goals and objectives?

2. Generate several examples of content-free goals.

3. In what way do learning and measurement theorists postulate that clear objectives contribute to learning?

4. Given the preceding discussion, what are some thoughts on an appropriate number of goals and objectives and specificity for goals and objectives?

Formulating valid goals. Goals are statements about broad skills within even broader domains. They structure what broad skills a child will attain within a large time frame. In contrast, instructional objectives are more specific statements about student behaviors that are sequenced approximations of broader goals. Following is a discussion of procedures for formulating those relatively general goals. One goal formulation activity universally found in America's schools is the individualized program planning for students identified as handicapped. This activity served as a context for discussing the process of writing valid goals for instruction. A goal is a statement of

intended student outcome sometime in the future in a given domain. The preceding discussion presented general principles for writing useful goals and objectives. Given these broad directives, where does a teacher begin in formulating a valid goal statement?

When teachers first approach the task of identifying goals, they frequently are confused by the limitless number of possible learning outcomes and by the lack of authoritative information concerning which goals are most valuable (Gronlund, 1968). The obvious starting point, however, is at the student's current level of performance in a given domain.

A goal can be written for each relevant domain, or broad area of need. In selecting relevant domains for children, however, there are several factors to consider. Wehman and McLoughlin (1981) list the following four questions to answer in identifying appropriate curriculum areas for students:

1. Why should the skills be taught?
2. Are the skills necessary to prepare students to ultimately function in complex heterogeneous community settings?
3. Could students function as adults if they did not acquire these skills?
4. Are there other important skills which might be taught more quickly and efficiently? (p. 55)

Wehman and McLoughlin (1981) provide the following description to illustrate an inappropriate goal domain for a special needs child: For a multiply handicapped toddler with severe physical disabilities, a major goal area or domain was established as "readiness" skills such as learning shape, size, and color discriminations. This choice as a major goal area left little time for working on other, more critical domains such as motor development, self-help skills, and language training. Wehman and McLoughlin comment that while this example may seem remote, such inappropriate selection of goal domains occurs frequently. Clearly, special educators and other IEP team members must give careful consid-

eration to appropriate focus on relevant, critical skill sets as they select goal domains.

York and Williams (1977) distinguish between "Skill Sequences Based on Normal Development," where domains and relevant skills for handicapped children parallel those of normal youngsters, and "Skill Sequences Based Upon the Logical Analysis of the Living Environment or the Analysis of Required Functions." In this second model, domains and relevant skills are derived from the skills that individuals must be able to perform to function in selected environments, i.e., restrictive educational settings or adult living arrangements. York and Williams suggest that the principles of normalization and functionality guide practitioners' selections of goal areas. They delineate four guidelines for selecting appropriate goal areas, with goal behaviors (a) substituting as completely as possible for normal skills, (b) appearing as age-appropriate as possible, (c) rendering the pupil as similar to "normal" as possible, (d) allowing the pupil to operate as independently as possible.

Once a domain is judged appropriate for a handicapped student, the next step in selecting a valid goal statement is to insure (a) that a discrepancy in skills exists between the student's current level of performance and his/her anticipated goal performance, and (b) that such a discrepancy is reasonable but ambitious to attempt to eliminate within a school year. The prediction of annual goals is a major concern to service providers (Gillespie-Silver, Schacter, & Warren, 1980). According to Carr (1979) emphasis should be "on the likelihood that a specific behavior will occur" rather than "on the accuracy of the prediction" (p. 89). Each prediction may be based on an interaction between the child's previous learning rate, the tasks involved, and available resources. In a given domain, one can compute a child's approximate rate of improvement over the preceding year and aim to overtake that previous rate of

progress. Formulating a "reasonable but ambitious" goal discrepancy is a difficulty; however, an important point to consider is that goals, if they are monitored, can be adjusted as required.

REVIEW QUESTIONS

1. Lola is a nine year old girl placed in a class for children with moderate mental retardation. Her self-help skills are well developed and she understands most directives told to her. Her spoken vocabulary and syntax are very limited and she recently has begun to learn some sign language. Using Wehman and McLouglin's questions as well as York and Williams' guidelines, generate two goal areas that might be appropriate for Lola.

   a. _____

   _____

   _____

   b. _____

   _____

   _____

2. Mrs. Fort is a second grade teacher. Her lowest reading group has acquired the following skills in the past three months: reading consonant-vowel-consonant words reading words with the final e rule, reading one-half of the words on the preprimer Dolch sight word list.

   a. Describe a goal performance for the reading group.

   _____

   _____

   _____

b. Describe the discrepancy in skills between the students' current level of performance in reading and their anticipated goal performance.

_____

_____

_____

c. Provide a persuasive rationale for why this discrepancy represents a "reasonable but ambitious" goal.

_____

_____

_____

Along with the prediction of a reasonable but ambitious amount of progress, one also must clarify the types of learning outcomes that are appropriate for the relevant domain. In the cognitive domain, Bloom (1956) has developed a taxonomy of educational objectives. This taxonomy proposes six levels of objectives that progress in difficulty from objectives involving knowledge to those concerning evaluation. As an educator writes an objective that involves cognition, he/she might inspect Bloom's taxonomy, and select a level of cognition both of appropriate difficulty for a student's current performance level and of appropriate match with a given subject matter. A brief description of Bloom's taxonomy follows:

Condensed Version of the
Taxonomy of Educational Objectives

Cognitive Domain

KNOWLEDGE

1.00 KNOWLEDGE

Knowledge, as defined here, involves the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material. Although some alteration of the material may be required, this is a relatively minor part of the task. The knowledge objectives emphasize most of the psychological processes of remembering. The process of relating is also involved in that a knowledge test situation requires the organization and reorganization of a problem such that it will furnish the appropriate signals and cues for the information and knowledge the individual possesses. To use an analogy, if one thinks of the mind as a file, the problem in a knowledge test situation is that of finding in the problem or task the appropriate signals, cues, and clues which will most effectively bring out whatever knowledge is filed or stored.

1.10 Knowledge of Specifics

The recall of specific and isolable bits of information. The emphasis is on symbols with concrete referents. This material, which is at a very low level of abstraction, may be thought of as the elements from which more complex and abstract forms of knowledge are built.

1.11 Knowledge of Terminology

Knowledge of the referents for specific symbols (verbal and non-verbal). This may include knowledge of the most generally accepted symbol referent, knowledge of the variety of symbols which may be used for a single referent, or knowledge of the referent most appropriate to a given use of a symbol.

1.12 Knowledge of Specific Facts

Knowledge of dates, events, persons, places, etc. This may include very precise and specific information such as the specific date or exact magnitude of a phenomenon. It may also include approximate or relative information such as an approximate time period or the general order of magnitude of a phenomenon.

1.20 Knowledge of Ways and Means of Dealing with Specifics

Knowledge of the ways of organizing, studying, judging, and criticizing. This includes the methods of inquiry, the chronological sequences, and the standards of judgment within a field as well as the patterns of organization through which the areas of the fields themselves are determined and internally organized. This knowledge is at an intermediate level of abstraction between specific knowledge on the one hand and knowledge of universals on the other. It does not so much demand the activity of the student in using the materials as it does a more passive awareness of their nature.

1.21 Knowledge of Conventions
Knowledge of characteristic ways of treating and presenting ideas and phenomena. For purposes of communication and consistency, workers in a field employ usages, styles, practices, and forms which best suit their purposes and/or which appear to suit best the phenomena with which they deal. It should be recognized that although these forms and conventions are likely to be set up on arbitrary, accidental, or authoritative bases, they are retained because of the general agreement or concurrence of individuals concerned with the subject, phenomena, or problem.

1.22 Knowledge of Trends and Sequences
Knowledge of the processes, directions, and movements of phenomena with respect to time.

1.23 Knowledge of Classifications and Categories
Knowledge of the classes, sets, divisions, and arrangements which are regarded as fundamental for a given subject field, purpose, argument, or problem.

1.24 Knowledge of Criteria
Knowledge of the criteria by which facts, principles, opinions, and conduct are tested or judged.

1.25 Knowledge of Methodology
Knowledge of the methods of inquiry, techniques, and procedures employed in a particular subject field as well as those employed in investigating particular problems and phenomena. The emphasis here is on the individual's knowledge of the method rather than his ability to use the method.

1.30 Knowledge of the Universals and Abstractions in a Field
Knowledge of the major schemes and patterns by which phenomena and ideas are organized. These are the large structures, theories, and generalizations which dominate a subject field or which are quite generally used in studying phenomena or solving problems. These are at the highest level of abstraction and complexity.

1.31 Knowledge of Principles and Generalizations
Knowledge of particular abstractions which summarize observations of phenomena. These are the abstractions which are of value in explaining, describing, predicting, or in determining the most appropriate and relevant action or direction to be taken.

1.32 Knowledge of Theories and Structures
Knowledge of the body of principles and generalizations together with their interrelations which present a clear, rounded, and systematic view of a complex phenomenon, problem, or field. These are the most abstract formulations, and they can be used to show the interrelation and organization of a great range of specifics.

INTELLECTUAL ABILITIES AND SKILLS

Abilities and skills refer to organized modes of operation and generalized techniques for dealing with materials and problems. The materials and problems may be of such a nature that little or no specialized and technical information is required. Such information as is required can be assumed to be part of the individual's general fund of knowledge. Other problems may require specialized and technical information at a rather high level such that specific knowledge and skill in dealing with the problem and the materials are required. The abilities and skills objectives emphasize the mental processes of organizing and reorganizing materials to achieve a particular purpose. The materials may be given or remembered.

2.00 Comprehension
This represents the lowest level of understanding. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications.

2.10 Translation
Comprehension as evidenced by the care and accuracy with which the communication is paraphrased or rendered from one language or form of communication to another. Translation is judged on the basis of faithfulness and accuracy, that is, on the extent to which the material in the original communication is preserved although the form of the communication has been altered.

2.20 Interpretation
The explanation or summarization of a communication. Whereas translation involves an objective part-for-part rendering of a communication, interpretation involves a reordering, rearrangement, or a new view of the material.

2.30 Extrapolation
The extension of trends or tendencies beyond the given data to determine implications, consequences, corollaries, effects, etc., which are in accordance with the conditions described in the original communication.

3.00 Application
The use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures, or generalized methods. The abstractions may also be technical principles, ideas, and theories which must be remembered and applied.

4.00 Analysis
The breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or relations between the ideas expressed are made explicit. Such analyses are intended to clarify the communication, to indicate how the communication is organized, and the way in which it manages to convey its effects, as well as its basis and arrangement.

4.10 Analysis of Elements
Identification of the elements included in a communication.

4.20 Analyses of Relationships
The connections and interactions between elements and parts of a communication.

4.30 Analysis of Organizational Principles
The organization, systematic arrangement, and structure which hold the communication together. This includes the "explicit" as well as "implicit" structure. It includes the bases, necessary arrangement, and the mechanics which make the communication a unit.

5.00 Synthesis
The putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements, etc., and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before.

5.10 Production of a Unique Communication
The development of a communication in which the writer or speaker attempts to convey ideas, feelings, and/or experiences of others.

5.20 Production of a Plan, or Proposed Set of Operations
The development of a plan of work or the proposal of a plan of operations. The plan should satisfy requirements of the task which may be given to the student or which he may develop for himself.

5.30 Derivation of a Set of Abstract Relations
The development of a set of abstract relations either to classify or explain particular data or phenomena, or the deduction of propositions and relations from a set of basic propositions or symbolic representations.

6.00 Evaluation
Judgments about the value of material and methods for given purposes. Quantitative and qualitative judgments about the extent to which material and methods satisfy criteria. Use of a standard of appraisal. The criteria may be those determined by the student or those which are given to him.

6.10 Judgments in Terms of Internal Evidence
Evaluation of the accuracy of a communication from such evidence as logical accuracy, consistency, and other internal criteria.

6.20 Judgments in Terms of External Criteria
Evaluation of material with reference to selected or remembered criteria.

An analogous taxonomy for the affective domain is available (Krathwohl, Bloom, & Masia, 1964), including the major categories of Receiving (attending), Responding, Valuing, Organization, and Characterization by a value or value system. Teachers can use such taxonomies to structure their selection of general goals or types of learning.

Once the practitioner has identified relevant types of learning outcomes for a student or group of students within a specific domain, he/she must generate a list of general goal behaviors or verbs for each learning type. Using an example, Gronlund (1968) describes a process of identifying and stating goal verbs. To clarify Gronlund's example, let's begin with the information that a teacher, Mrs. Jackson, has identified "reading" as a relevant domain for the student, Joanne. Joanne is reading on a beginning first grade level and Mrs. Jackson selects, from Bloom's taxonomy, comprehension as the appropriate level of cognition and then Mrs. Jackson identifies a "reasonable but ambitious" goal as understanding written words of a second grade level. In identifying general goal behaviors, which constitute second grade reading comprehension, Mrs. Jackson again

> . . . decided to consult the Taxonomy of Educational Objectives (Bloom, 1956) and found there that comprehension was divided into three levels: translation, interpretation, and extrapolation. Her only problem was to translate these terms into second grade behavior terms! As she started to work, however, she was much encouraged, for the clues she had found in the analysis of her own materials and methods fell into place quite nicely. (p. 36)

The following table (adapted from Gronlund, 1968, p. 36) diagrams how Mrs. Jackson's goal verbs relate to the types of learning she judged relevant for Joanne:

Comprehension	Goal Verb	Goal Statements
1. Translation	Defines Paraphrases Demonstrates by example	
2. Interpretation	Explains Summarizes	
3. Extrapolates	Identifies implications, consequences, effects, corollaries Makes predictions	

(For information on a specific procedure for writing goal statements and thereby completing this chart , see "Behavioral formats for goals and objectives" below.)

A complementary procedure for formulating goal behaviors is to observe students' behaviors within the relevant domain in classes or settings that represent a less restrictive environment. For instance, let's say that a teacher has chosen classroom social behavior as a relevant domain for John, a fifth-grade student placed in a full-time special class. In formulating specific, meaningful behaviors to incorporate as goal verbs, she might enter the next less restrictive setting, a half-day special class, and observe appropriate social behavior for that setting. From that observation, the teacher might generate a list of appropriate behaviors for John to develop or improve so that he might make progress towards placement in the less restrictive setting.

An additional strategy for generating meaningful goal behaviors is to consult the target person or group; that is, to actually ask the involved student(s) to participate in formulating goals. Such a procedure employed in self-management strategies (Thoreson, Mahoney, 1974) and Goal Attainment Scaling (Carr, 1979), increases the likelihood that goal behaviors will be worthwhile, realized, generalized to other settings, and maintained over time.

Following are directions to students for formulating a social goal behavior (Fuchs & Deno, 1982). Borrowed from a self-management training program, this segment was used successfully in teaching mildly to moderately handicapped junior and senior high students to establish goals. It could be adapted so that it could be appropriate as a structured interview for generating social or academic goals for children of different ages.

DECIDING ON YOUR GOAL BEHAVIOR

1. Is there something about yourself you'd like to change? Choose something you'd like to stop doing, such as biting your nails or eating too much. You can also choose something you'd like to start doing, such as going out on dates or being nice to your sister. What would you like to change about yourself? Write it here.

---

2. The first step in changing something about yourself is to write what you'd like to change as a specific, countable behavior. For example, you might like to improve your relationship with your boy-friend"; so, you have to be more specific about what you mean. What specific countable actions do you have in mind? You may mean "holding hands" or "smiling at each other" or "talking pleasantly" or "being close." Can you write what you'd like to change as a specific, countable behavior? Do so here.

A Specific, countable behavior is a target behavior-- because you aim to change the behavior.

3. Sometimes it's difficult to decide exactly what your target behavior is. Here is a helpful way to describe more clearly your target

behavior: Write 2 or 3 examples of what you'd like to change. For example, John thought that he wasn't nice enough to his sister. It's hard to count "not being nice enough to his sister." So, he had to write it as a specific, countable target behavior. He listed two examples of what he meant by "not being nice enough": (1) When his sister cried, he'd call her a "brat," (2) When his sister got a bad grade, he'd call her "stupid." Then John decided that what he really meant was: "When his sister felt bad about something, he would call her names." Calling names is a specific, countable target behavior. Write 2 or 3 examples of what you'd like to change.

---

4. State your target behavior in terms of what you'd like to do instead of what you'd like not to do. For example, John would write, "When my sister feels bad, I'd like to be nice to her." If your target behavior isn't stated so that it indicates what you'd like to start doing, change it here.

---

5. If you are still having trouble deciding on your target behavior, try this. Look at someone who's good at what you'd like to start doing and write down what that person does. For example, Mary wanted to go out on dates, but she didn't know how to get asked out. Karen was asked out often. So, Mary watched Karen with boys for a few days and found that Karen smiled and answered boys quickly. "Smiling and answering boys quickly" then became Mary's target behavior. Can you think of someone who's good at what you want to start doing? Watch that person and write down what he or she does.

---

6. Look for <u>situations that happen just before</u> your target behavior. These are the <u>antecedent conditions</u>. For example, John's target behavior was "calling his sister names." The antecedent conditions to (or situations which happen just before) calling his sister names were: (1) his sister crying, (2) his sister getting a bad grade; in general--his sister feeling bad. What are antecedents to your target behavior? List some here.

_____

In general, the antecedent to your target behavior is _____.

Put this antecedent and your target behavior into this chart:

ANTECEDENT	TARGET BEHAVIOR

7. Finally, write down your goal.

My goal is: Given _____ (antecedent),

I will increase _____ (target behavior--a specific, countable behavior you'd like to start doing).

(Fuchs & Deno, p. 2).

Goal Attainment Scaling (GAS, Carr, 1979) provides a structure, a set of specific steps, for establishing goal behaviors. As with self-management strategies, including the student or group of students in the selection of goals is critical in GAS. Four essential steps in GAS are: (a) the teacher, student, as well as any other relevant participants (e.g., parents, other school personnel), decide mutually on general goals such as "improved personal grooming" or "reduced errors in number facts;" (b) each participant assigns a

weight or a number value to each general goal so that the summed weight across all the general goals equals 100; (c) the teacher breaks down each goal into a set of concrete behaviors. These behaviors represent a continuum of alternative behavioral outcomes ranging from most to least desirable within each general goal by a description of the likelihood that that behavioral statement will be achieved. Then, baseline performance is identified as one of the behavioral statements, and a weight; (d) finally, a student's functioning, at any given time is described numerically by i) within a goal, identifying the best-fitting behavioral statement and multiplying the outcome weight by the goal weight; and then ii) across goals, summing the products (see "Goal Attainment Scaling as a Useful Tool for Evaluating Progress in Special Education", attached in the Appendix). GAS structures the process of goal formulation, even as it emphasizes the importance of including the learner(s) in the process of identifying goals.

Various groups have developed lists of goals and objectives for elementary and secondary grade students. Such attempts include those of Havighurst (1953), Henry (1953), Kearney (1953), McCormack, Chalmers, and Gregorian (1976), Williams and Fox (1977), and the Cambridge Conference on School Mathematics (1963). Some school districts have compiled or purchased IEP goal and objective banks (Tymitz, 1981). While such materials may alleviate a teacher's burden of creating goals and objectives, one must recognize the importance of tailoring goals and objectives to the needs of the individual or group for whom the goals and objectives are being written. Goals and objectives are useful in structuring learning, teaching, and evaluation only as long as those student outcomes have high content validity with respect to students' needs, current performance levels, and educational programs.

Nevertheless, the job of creating relevant, useful goals and objectives can be made easier if teachers within schools or programs collaborate, to some extent, to identify relevant goals. Such cooperation can result in several advantages. First and most obvious, such a division of labor may result in time savings. A second advantage of collaboration among teachers is the facilitation of special education students' movement to less restrictive environments: For example, if a resource teacher is clear about the minimum goals and objectives for successful beginning-of-the-year functioning in a second grade classroom in her school, then she might incorporate that set of goals and objectives into her first-grade student's IEP, with the hope that working towards those goals will facilitate the student's mainstreaming next year. Another advantage of common cores of goals and objectives within schools or programs is that the writing of such goals and objectives can lead to the formation of criterion-referenced test item pools with which student progress and programs can be evaluated. Another advantage is that these common cores can be indexed to the curriculum materials available in a school for teaching or reinforcing the skills identified in the goals and objective.

In formulating valid goals, then, a teacher ought to consider:

- the student's current performance levels,
- high priority goal areas for adaptive functioning in relevant settings,
- a reasonable but ambitious segment of anticipated growth,
- types of learning outcomes within domains, including functioning within less restrictive settings,
- corresponding goals behaviors or verbs,
- a student's input concerning meaningful goals, and
- collaboration among colleagues.

REVIEW QUESTIONS

1. What is the first step in formulating goals?

2. Describe in what way the principles of normalization and functionality might guide a practitioner's selection of goal areas.

3. How might one assess what a reasonable but ambitious goal is for a given student?

4. Describe what taxonomies of objectives are and how they might be used in formulating goals.

5. In what ways might an educator formulate goals in order to facilitate movement towards less restrictive environments?

6. What are some advantages and disadvantages in collaborating on goals and using commercial materials, respectively?

Formulating valid objectives. Whereas goals are statements about broad skills, instructional objectives are specific statements about student behaviors that must be mastered in order to achieve annual goals. Sequenced instructional objectives structure the selection of specific instructional procedures and the ongoing formative evaluation of the appropriateness of the instructional program.

The relationship between goals and objectives typically is described in one of two ways. Some, such as Walker (1977) or Bloom et al. (1971) subscribe

to the task-analytic view; that is, as Walker (1977) noted in discussing Individual Educational Plans (IEPs), "annual goals should bear the same relationship to short-term objectives in the IEP as the terminal objective in task analysis bears to such tasks or intermediate objectives used to achieve the terminal objective" (p. 151).

Such a task analysis is the process of breaking down specific skills into smaller steps, which represent easier learning units. The process involves a logical sequencing of skills from easier to harder (Wehman & McLoughlin, 1981). A purpose of task analysis is to employ learning theory principles in the sequencing of instruction (Bloom et al., 1971), and thereby to improve the monitoring and success of instruction. Of course, one's theoretical perspective will dictate the character of a task analysis.

> For example, a developmental psychologist might begin by diagnosing the developmental level of the child and then apply the learning process associated with that level. . . . [Others] approach the analysis of learning to read from a perceptual point of view. . . . [One might] postulate three sequential and to some degree overlapping phases in acquiring this skill: recognizing and making discriminative responses to printed letters, figures, and symbols; decoding letters to sounds; and utilizing higher order units of the previously learned structures. (Bloom et al., 1971, p. 26)

In Figure 1, Gagne (1963) analyzes two math objectives from a stimulus-response perspective.

The basic steps in task analysis, regardless of one's theoretical viewpoint, are (a) specifying the main task (the goal), (b) identifying subtasks at the next easier level, (c) treating each subtask as a main task and repeating the analytic procedure, (d) terminating the analysis when a subtask matches a pupil's entry level (Thiagarajan, Semmel, & Semmel, 1974). For judging the adequacy of a task analysis, Thiagarajan, Semel, and Semel (1974) suggest the following five criteria with associated questions:

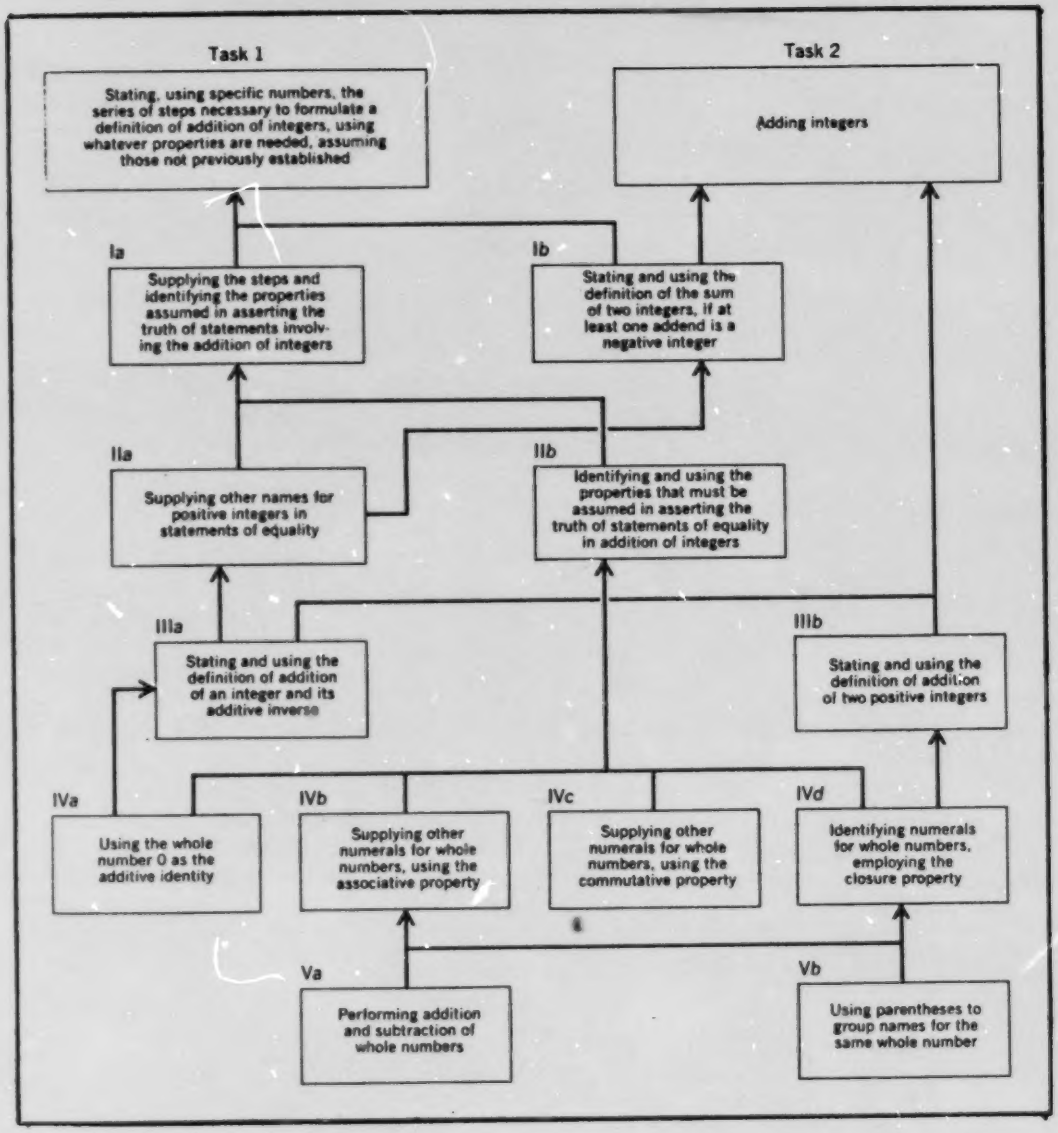
Task 1
Stating, using specific numbers, the series of steps necessary to formulate a definition of addition of integers, using whatever properties are needed, assuming those not previously established
Task 2
Adding integers
Ia
Supplying the steps and identifying the properties assumed in asserting the truth of statements involving the addition of integers
Ib
Stating and using the definition of the sum of two integers, if at least one addend is a negative integer
IIa
Supplying other names for positive integers in statements of equality
IIb
Identifying and using the properties that must be assumed in asserting the truth of statements of equality in addition of integers
IIIa
Stating and using the definition of addition of an integer and its additive inverse
IIIb
Stating and using the definition of addition of two positive integers
IVa
Using the whole number 0 as the additive identity
IVb
Supplying other numerals for whole numbers, using the associative property
IVc
Supplying other numerals for whole numbers, using the commutative property
IVd
Identifying numerals for whole numbers, employing the closure property
Va
Performing addition and subtraction of whole numbers
Vb
Using parentheses to group names for the same whole number

Figure 1. Task analysis of two math objectives.

(R. M. Gagne, Learning and proficiency in mathematics. Mathematics Teacher, 1963, 56, 623.)

1. Relevance. Is the main task relevant to the effective performance?

2. Completeness. Are enough subtasks listed to cover the performance of the main task? Has any essential subtask been omitted?

3. Triviality. Is any subtask included which is simpler than the entry level of the student?

4. Necessity. Is each subtask necessary for the performance of the main task? Are any of the subtasks unnecessary?

5. Redundancy. Is any subtask repeated more than once with or without minor changes in wording? Is any set of subtasks an alternate for the performance contained in another set of subtasks? (p. 41)

Once a task analysis has been performed, the subtasks can be rephrased (see "Behavioral formats for goals and objectives" below) into objectives that relate to the goal or the main task. Clearly, the task analytic view on the relationship between goals and objectives is more appropriate with severely handicapped pupils where annual goals are likely to be limited main behaviors and where subtasks, involving very small behavioral steps, would constitute a relevant educational and evaluation program across a long period.

With nonhandicapped and mildly handicapped students, a skills sequence view on the relationship between goals and objectives may be more appropriate. According to York and Williams (1977), "Skill sequences are hierarchies. . . of behaviors which progress from zero skills to competent functioning in major developmental areas. . ." (p. 20). An example of a skills sequence for first grade written expression skills is:

Area: Capitalization and Punctuation
Skills: Copies sentences correctly
Capitalizes first word of a sentence
Capitalizes first letter of a proper name
Uses period at the end of a sentence
Uses question mark after a written question (Mercer & Mercer, 1981, p. 425)

The skills sequence delineates appropriate first-grade capitalization and punctuation skills, in order of difficulty. In using such a skills sequence

to organize goals and objectives, one would operationalize the "area," capitalization and punctuation, into a goal statement and then operationalize the "skills" into statements of behavioral objectives. (The module by Hofmeister and Preston on Curriculum-Based Assessment, in this series, discusses skill hierarchies in more detail.)

Each skill in a skills sequence can be task analyzed; and in planning instruction, one might wish to perform such an analysis. However, in a skills sequence view on the relationship between goals and objectives, the instructional and evaluation units are larger. That is, in contrast to a task analytic view, the goal statements encompass broad, relatively ambitious segments of growth and, similarly, the behavioral objectives are sequenced skills, each of which is large enough to withstand an elaborate task analysis. Figure 2, borrowed from Wehman and McLoughlin (1981), illustrates the relationship between goals, objectives, and task analysis from a skills sequence perspective.

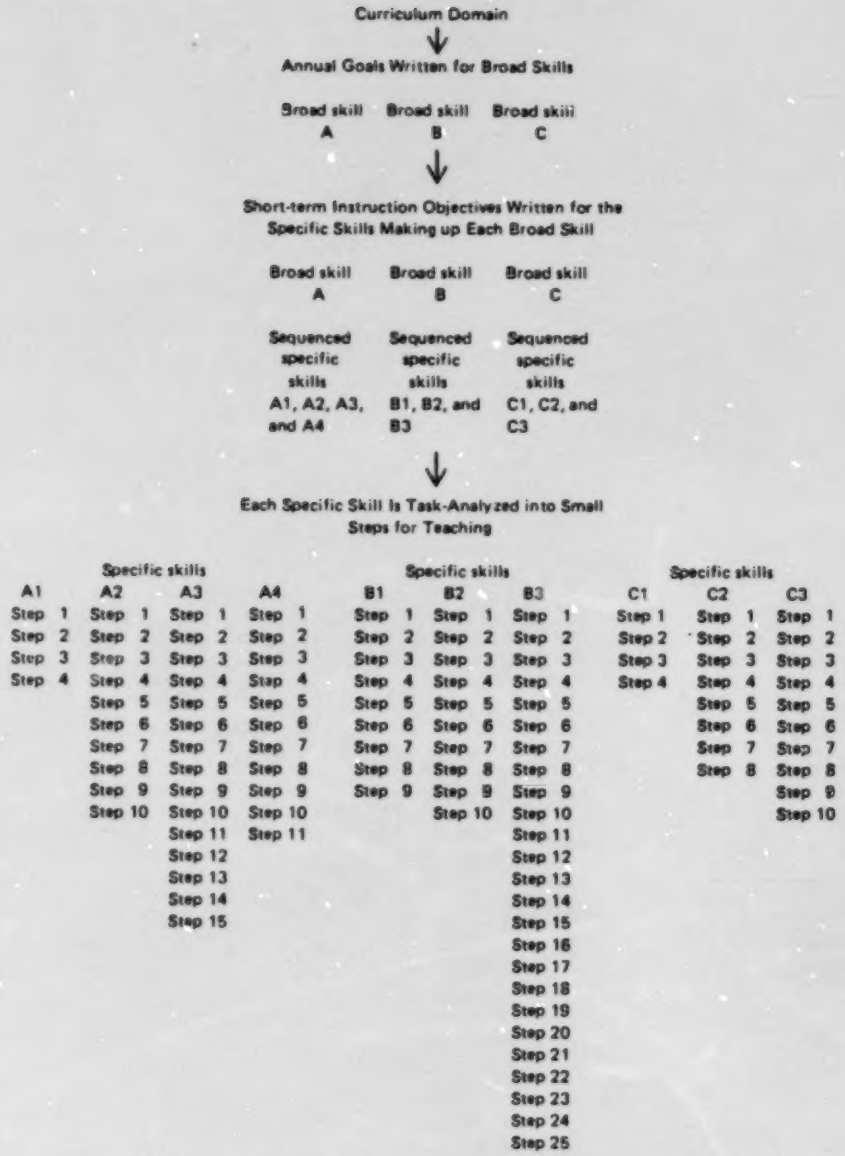
Curriculum Domain
Annual Goals Written for Broad Skills
Broad skill A
Broad skill B
Broad skill C
Short-term Instruction Objectives Written for the Specific Skills Making up Each Broad Skill
Broad skill A
Broad skill B
Broad skill C
Sequenced specific skills A1, A2, A3, and A4
Sequenced specific skills B1, B2, and B3
Sequenced specific skills C1, C2, and C3
Each Specific Skill Is Task-Analyzed into Small Steps for Teaching
Specific skills
A1 Step 1 Step 2 Step 3 Step 4
A2 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10
A3 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10 Step 11 Step 12 Step 13 Step 14 Step 15
A4 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10 Step 11
Specific skills
B1 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9
B2 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10
B3 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10 Step 11 Step 12 Step 13 Step 14 Step 15 Step 16 Step 17 Step 18 Step 19 Step 20 Step 21 Step 22 Step 23 Step 24 Step 25
Specific skills
C1 Step 1 Step 2 Step 3 Step 4
C2 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8
C3 Step 1 Step 2 Step 3 Step 4 Step 5 Step 6 Step 7 Step 8 Step 9 Step 10

Figure 2. Relationship of goals, objectives, and task analysis. (P. Wehman & P. J. McLoughlin, Program development in special education. New York: McGraw-Hill, 1981, p. 61).

REVIEW QUESTIONS

1. Distinguish between a task analytic and a skills sequence view on the relationship between goals and objectives?

   In what situations is one view more appropriate than another?

2. Perform a task analysis on the behavior "Washing one's own hair."

3. Generate a skills sequence for first-grade handwriting skills.

Behavioral format for stating goals and objectives. Having developed general lists of instructional goals and objectives, one step remains. That is, refining each general goal and objective into an operational, replicable behavioral statement that structures instruction and provides an objective format for assessing students' progress and the appropriateness of instructional programs.

A number of writers have emphasized the importance of phrasing educational objectives in unambiguous observable human performance terms (Gagne, 1964; Lindvall, 1964, Tyler, 1949). As Mager (1975) points out, "A meaningfully stated objective is one that succeeds in communicating intent; the best statement is the one that excludes the greatest number of possible meanings other than your intent" (p. 20). Three elements facilitate such clear communication. An objective should state:

1) What the learner will do;

2) Under what conditions the learner will do this; and

3) How well it must be done.

These three elements, respectively, are performance, conditions, and criteria (Mager, 1975).

Performance must be stated in terms of a verb that denotes overt action. The verbs state, match, list, computs, and name are actions that can be observed unambiguously. On the other hand, verbs such as know, comprehend, learn, appreciate, respect, and understand only can be inferred; that is, one can, on the basis of other activities, infer whether an individual knows, comprehends, appreciates, etc. The actual behaviors upon which that inference is made are unstated; a communication failure can occur, and one individual's inference is likely to be different from another's. Such evaluation of the

mastery of objectives, consequently, is subjective and not necessarily replicable or reliable. In preparing a goal or objective statement, therefore, Mager (1975) recommends that one write a statement that describes the main intent or performance expected of the student. Then, if that performance is covert, add a simple, direct indicator behavior by which the main performance will be judged.

In addition to overt performance, condition is an important element of a behavioral objective. To state a goal or objective clearly, one must include a description of the conditions that will be imposed when students are demonstrating their mastery of an objective. Mager (1975) lists four questions to ask oneself in formulating the conditions of a behavioral objective:

1. What will the learner be allowed to use?
2. What will the learner be denied?
3. Under what conditions will you expect the terminal behavior to occur?
4. Are there skills which you are specifically NOT trying to develop? Does the objective exclude such skills? (p. 51)

Examples of conditions in goals and objectives are: "Given a list of animals," "Given a paper and pencil," "Given a calculator, without the aid of fingers or other concrete objects," "Given a wheelchair."

Once the condition and performance of a behavioral goal or objective have been specified, there should be adequate information for structuring test items to assess mastery of the objective. For example, with the statement "Given a pencil and 10 problems written on paper, and without the aid of concrete objects, the student will write answers to 2 digit and 2 digit addition problems involving carrying." This statement provides the teacher with the following information for creating a test: He/She must prepare a paper with ten 2 digit

to 2 digit addition problems with carrying, give this paper and a pencil to the student, tell the student that he/she is not permitted to employ any concrete objects. The testing format, consequently is established as the objective is written. In fact, in order to assess the adequacy of an objective, one might ask him/herself whether there is sufficient information to create a test. If not, one might wish to embellish the goal or objective.

The third element in writing behavioral goals and objectives is the specification of criteria or the standards against which acceptable performance will be judged. Speed is a common way of describing a criterion of acceptable performance; one specifies a time limit within or a rate of performance at which the behavior must occur. A second type of criterion is accuracy, i.e., "90% accuracy," or "to the nearest whole number," or "with no more than 2 errors." Once a criterion has been added to an objective, one can score and evaluate an objective-related test. With the example above, let's finish the objective: "Given a pencil and 10 problems written on paper, and without the aid of concrete objects, the student will write answers to 2 digit to 2 digit addition problems involving carrying with 90% accuracy and within 1 minute." Given this objective, one can administer the test and assess mastery on the objective in relation to the criteria stated in the objective, thereby engaging in criterion-referenced assessment of goals and objectives.

Complete behavioral goals and objectives, then, structure the learning, teaching, and evaluation process. They satisfy the precision principle, providing clear information to students concerning what is expected of them. They direct teachers' instructional planning and curriculum planning by specifying desired outcomes and conditions of performance. They structure evaluation by creating the testing format as well as dictating the evaluation criteria.

REVIEW QUESTIONS

1. What is a rationale for stating goals and objectives behaviorally?

2. List 5 overt verbs and 5 unobservable verbs.

overt	unobservable
a.	f.
b.	g.
c.	h.
d.	i.
e.	j.

3. Given the following goals, underline the behavior, circle the condition, and cross out the criteria. Then, indicate whether the goal is complete or incomplete.

Goal	Check One: Complete	Incomplete
a) Given a fourth-grade reading passage, J. will read 40 words per minute (wpm) with fewer than 2 errors.		
b) Given single digit addition problems, J. will be able to write answers at 30 problems per minute.		
c) M. will spell words.		
d) F. will say letters, 50 per minute.		
e) Given an oral question of 3 words, student will respond with an appropriate 2 word sentence.		
f) Given a math problem, student will answer correctly.		
g) Given a reading passage in Friends, student will read aloud at 50 wpm with 5 or fewer errors.		
h) With a paper and pencil, student will divide.		

4. Given (g) above, describe a measurement procedure for assessing mastery.

A Concluding Comment

Formulating behavioral goals and objectives provide the structure for enhancing student learning and teacher success. They do not, however, ensure such benefits. Even conceptually appropriate and behaviorally precise goal statements will fail to affect student and teacher outcomes if those goals are not employed continuously. Research (Melton, 1978) indicates that students must be aware of goals and objectives, if learning is to be enhanced. Furthermore, investigators (Baldwin, 1976; White, 1977) have demonstrated that teachers need not only to measure student progress towards goals but also to evaluate measurement data in meaningful ways in order to insure student growth and teacher success. Alternate procedures for monitoring student progress towards goals and objectives have been developed (Carr, 1979; Lovitt, 1977; Mirkin, Deno, Fuchs, Wesson, Tindal, Marston, & Kuehnle, 1981; White & Haring, 1980) and ought to be considered as goals and objectives are developed.

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chapter eight

How to Establish Objectives

Companies with clear objectives and established policies are quiet places in which to work.

Don't let others push their expectations onto you until you know your objectives.

Get your margin, then your philosophy.

After the effectiveness areas and effectiveness standards for a manager's position are established, they are converted into objectives. An objective is a highly specific statement about what is to be accomplished for a particular effectiveness standard. A single effectiveness standard usually produces a single objective.

The purpose of this chapter is to show how any effectiveness area or standard can be converted into an objective.

The topics taken up in this chapter are:

Sound Objectives Must Be Measurable
The Time Element
The Quantity Element
The Level of the Objective
Priorities of Objectives
How Many Objectives?
Errors to Avoid
Tests of a Sound Objective

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From W.J. Reddin, Effective management by objectives: The 3-D method of MBO. New York: McGraw-Hill, 1971.

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Sound Objectives Must Be Measurable

An objective is useful only if its attainment is measurable. If it is not measurable, it is impossible to determine whether the objective has been achieved. "To increase profits" is an unsatisfactory statement of an objective, as it does not say how much or when. A better statement would be: "To increase profits to $200,000 during 1972." Two essential and measurable elements of an objective are:

Time	(How soon)
Quantity	(How many)

Two other measurable elements which are sometimes included in objectives are:

Quality	(How well)
Cost	(How much)

These last two items are often omitted from the statement of the objective, as they are clearly inferred from the wording or the facts of the situation.

The Time Element

Time is one of the easiest elements to include in an objective. It should never be omitted. There are four basic forms which are used in this book.

End Form:	EO	[End of] JUL (By the end of July)
	EO	1972 (By December 31, 1972)
Beginning Form:	BO	[Beginning of] JUL (By July 1)
	BO	1972 (By January 1, 1972)
During Form:	DUR	JUL–NOV. (From July 1 to November 30)
	DUR	1972 (From January 1, 1972 to December 31, 1972)
Specific Form:	ON	DEC 16 (On December 16)
	BY	DEC 16 (On or before December 16)

If the year is not stated, it means the current year. The end form is most widely used, as objectives are usually in terms of achieving something by a specific date. It is better to express a date in terms of a month end rather than in terms of the beginning of the next month. August 31 seems a long way from September 1. A focus on the earlier date tends to avoid procrastination. The specific form tends to be used when a manager's objectives interlock tightly with those of others.

BY JUL 16 have a recommendation and sample survey results prepared on which package design should be used for product 'Y'.

The Long Term Objectives are most often set for yearly or quarterly time periods. But the battle does not win the war nor the sale win the customer forever. Managerial effectiveness is not concerned solely with the present or short run, but with the long run as well. Objectives, while set for quarterly or yearly time periods, must still reflect an understanding of the future. A failure to do this can lead to a variety of problems. A marketing manager who decides to introduce a new brand without looking at brand strategy several years ahead is obviously in error. Also in error is a plan to reduce maintenance expenditures without considering long-term machinery capability. Any public servant knows that it is unwise to start in new directions shortly before an election. The larger the unit, the longer-term the objectives usually tend to be. As a very rough guide, objectives are most often set for the following time periods:

Corporate	(1 year)	(5 years)	(10 years)
Divisional	(1 year)	(5 years)	
Departmental	(1 year)		
Managerial	(3 months)	(1 year)	

If an objective is set for too short a time period, it may be nothing more than a prediction. In the short term nothing much could be done to change things, anyway. If an objective is set for too long a time period, it may be simply a hope, as too many noncontrollable events could occur in the interim.

The Quantity Element

All objectives must be quantified in some way or their achievement cannot be measured. If you cannot measure it, forget it. The units most often used are monetary or physical, but others are also used:

MONETARY UNITS	"$60,000 sales EO DEC 1972"
NONMONETARY UNITS	"Total of 60 new accounts by EO 1972"
	"Reduction in model change time from 28 days to 25 days by EO 1972"
PROPORTION	"Average of 28 percent share of national market DUR 1973"

Basis for Quantity Estimate Within every objective, whether explicitly stated or not, one thing, state, condition, or amount is compared with some base. As most objectives aspire to superior performance, implicit in them is some comparison with the past period. An objective which simply states "100 units" is often another way of saying "10 units more than last year."

Examples of the many possible bases which can be selected for an objective are:

PAST PERIOD	(*x* above 1972)
UNITS PROCESSED	(*x* percent of those handled)
OTHER'S FORECAST	(*x* percent of *Marketing Guide's* market estimate)
COMPETITORS	(Percent of market)
MARKET STATISTICS	(Percent of disposable income)
UTILIZATION	(Percent utilization of space)
	(Percent utilization of capital)
	(Percent utilization of stock)
	(Percent utilization of machinery)
DEVIATIONS FROM	Within a range of . . .
	Not outside of . . .
	With (+) (−) *x* percent of . . .

This kind of wording is often used with standard costs, deadlines, forecasts, targets, budgets, and PERT and CPM networks.

Unsatisfactory Quantity Indicators It is not satisfactory for objectives to use such words as the following without specific quantification:

increase
decrease
maximize
minimize
satisfy
optimize

These words at most indicate direction only and not how much.

Qualitative Objectives Not Usually Necessary Most so-called "qualitative" objectives should not be considered objectives at all but should simply be called "activities." For any qualitative objectives, "Why?" should be asked, and then the conversion from input activities to output objectives should be made.

On the left below is a list of qualitative objectives which are used as an illustration in one popular MBO book to suggest that such qualitative objectives must sometimes be used. This is incorrect. To illustrate, on the right are this author's conversions to show that such qualitative objectives are usually unnecessary.

Actual suggested qualitative objectives in standard MBO book	*Effective MBO conversion to illustrate that qualitative objectives are usually found to be activities. By asking the purpose of the activities, the quantitative objectives are derived*
Conduct monthly management development sessions for superintendents in techniques of standard cost program.	Have 50 percent of superintendents using standard cost programming techniques on at least two projects EO JUL 1972.
Prepare a program for patent protection.	Have no patent loopholes in our patents discovered by our own staff, independent agents, or competitors DUR 1972.
Prepare and distribute an internal public relations manual.	Obtain an average of 75 percent unaided recall by all nonmanagerial employees of 50 percent of the key corporate activities or accomplishments of the prior month for each month DUR 1973.
Improve statistical reports to reduce time lag between production and publication dates.	Without decreasing usable content, reduce by an average of four days the time to distribute the following reports by EO SEP 1972.
Prepare quality control manual for supervisors.	Eighty-five percent of first-line supervisors to know eight of the ten key points in company quality control practice by EO DEC 1972.
Improve appearance, packaging, and design of products.	For each item in product line, design a package which will receive more consumer jury votes than any competing product EO NOV 1972.
Undertake to ally research efforts more closely with production needs.	Have at least 80 percent of proposals to production manager accepted DUR 1972.

It is true that most of these conversions from inputs to outputs involve a broader view of one's job, a greater responsibility for the staff function, and a higher cost of measurement.

Specific, Not General In addition to having clear time and quantity elements, the thing referred to in the objective must be stated unambiguously; examples are:

General	*Specific*
Staff	Hourly paid staff in factory A
Product sales	Products A and D
Customers	Class B and F accounts who have made purchases in the past six months

Such specificity facilitates measurement and certainly aids clear thinking about MBO.

The Level of the Objective

An objective should be attainable with a manager's level of motivation, competence, and resources, and it must be tied to the corporate plan. The objective must reflect the manager's and his subordinates level of experience, training, skill, capability, and motivation. It must also reflect the level of resources that the manager can obtain. Objectives may well reflect a more ambitious level of performance than pre-

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viously. This is expected to result not from working harder, but from working smarter and with better vertical and horizontal alignment.

The quantitative element of an objective may reflect levels:

As they have been in the past
As they are now
As they could be now
As they could be in the future

The selection the manager makes will depend on many things. It is one of the most important decisions he will make. He must decide what the appropriate level of effectiveness is for himself. He must decide on whether he has the skill and motivation to improve. He must decide on whether a rearrangement of his or his subordinates' jobs could lead to levels of achievement previously unobtainable. The decision requires a manager to consider his previous level of attainment—Was it too low? Is there anything he can do about it? To be avoided is the predictive objective which simply sets the level at what could probably be attained without any effort.

Sophisticated MBO implementations lead to a variety of objectives being tied to different budget levels. A marketing manager will say, "I can obtain 32 percent of the market if I am given a market budget of $800,000, but with $900,000 I can obtain 35 percent." One president says:

> Our budgets are not an objective, but are the results of objectives. Each year we operate with a minimum budget level which represents the amount of money we believe it is going to cost to do a job which satisfies our minimum objectives and in which we have a high confidence level. We also operate with a quota level, which represents substantially increased performance. Financial plans are made for both levels of operation and are determined to be possible and practical. Budgets indicate what we expect to spend to get the job done. Within the budget we indicate the most important factors. And these are the standards which represent the percentage of the sales dollar we are willing to spend to get various parts of the job performed. Obviously, the standards are more important than the budgeted amounts, since we are willing to spend more money than we have budgeted if we can get the increased business on standard costs.

The factors to consider when deciding on the level of an objective are:

Level necessary to achieve one- to five-year plans
Objectives of associated positions
Budget available
Possible additional budget available
Skill of manpower resource
Motivation level of manpower resource
Past performance experience

Some managers like the concept of the "ratchet principle," sometimes called "stretch." Both of these refer to obtaining a higher performance than previously with a similar resource level.

Priorities of Objectives

The importance of each objective should be indicated by assigning it a priority of 1, 2, or 3. The number 1 is assigned to objectives of highest priority, and so on. Several objectives may have the same priority. Such assignment of priorities helps to keep a perspective, especially when there are many objectives for one position.

With only a few objectives, it is a relatively simple matter to assign priorities. When there are many objectives, assigning relative weight is more difficult. An aid to doing this is the method of paired comparisons. The procedure is as follows:

1. Each objective is assigned a number.
2. The basis for assigning priority is established. This would presumably be "its importance to the position" or "its importance to the company plan."
3. Each objective is compared with each other objective, and one of them is assigned a higher priority.
4. The number of choices each objective receives is tallied, and from this the objectives are arranged in the order of priority.
5. The rank orders are converted to priorities of 1, 2, and 3.

How Many Objectives?

Managerial effectiveness can seldom be obtained by achieving a single objective, no matter how broadly it is written. Effectiveness is multidimensional: profit, for instance, may be obtained at the risk of losing customers or by sacrificing human resources. Sales may be obtained only by unduly increasing credit risks. Any manager who sees his effectiveness areas in simple black-and-white terms may perform well in the short term but may not in the long term. On the other hand, a large number of objectives usually indicates only that the essence of the job has not been understood.

ERRORS TO AVOID

In casting up their objectives, managers should be wary of these errors which frequently occur:

Objectives too high (overload)
Objectives too low (underload)
Objectives not measurable
Cost measurement too high

Too many objectives
Too complex objectives
Too long a time period
Too short a time period
Imbalanced emphasis

Most of these are self-explanatory and have been discussed earlier.

While opinions differ, having more than ten or so objectives probably indicates a fragmentation of the job rather than seeing it as a whole. Complex objectives tend to be produced as hedges against unsatisfactory performance—hidden in them are ifs and buts. Except for the top team, objectives need not usually cover more than a year, while less than a three-month time period is usually considered too short. Imbalanced emphasis would occur if there are five objectives covering 20 percent of the effectiveness areas of the position and one objective for the other 80 percent.

Managers should expect that they and their subordinates will make all these errors at least once or twice in the introductory stages of installing an Effective MBO system.

TESTS OF A SOUND OBJECTIVE

Sound objectives can be easily distinguished from unsound ones by being tested against this list.

TESTS OF OBJECTIVES

SOUND	PROBABLY UNSOUND
Measurable (quantitative)	Nonmeasurable (qualitative)
Specific	General
Results- (output-) centered	Activity- (input-) centered
Realistic and attainable	Minimum or unattainable
Time-bounded	Time-extended

Many factors in this list overlap somewhat, but, taken together as well as separately, they serve to identify clearly the characteristics of sound objectives that managers would want to establish for their positions. A good objective must be *measurable*, for without this its achievement cannot be established. It should be *specific* rather than general, so that

what is being measured is unambiguous. "Most product lines" is not as good a statement as "product lines A, C, and S." It should focus on *results* or *output* rather than activities or *input*, that is, on what a manager achieves rather than on what he simply does. "Implement budget control" is not as good as "Have budget control system in full operation." It should be seen as a *realistic* and *attainable* objective to both the superior and the subordinate rather than as a *minimum* or *unattainable* objective. It should be *time-bounded*, with clear time limits for completion rather than being time-extended.

NEW CONCEPTS INTRODUCED—CHAPTER 8

OVERLOAD
PREDICTIVE OBJECTIVE
PRIORITY
RATCHET PRINCIPLE
STRETCH
UNDERLOAD

OVERLOAD: Levels of objectives set too high to be attainable.

PREDICTIVE OBJECTIVE: An objective based on a prediction rather than a plan.

PRIORITY: The relative importance of an objective, indicated by the number 1, 2, or 3.

RATCHET PRINCIPLE: Setting a slightly higher objective than previously attained.

STRETCH: The difference between past and planned performance.

UNDERLOAD: Levels of objectives set so low they would be attained without effort.

Goal Attainment Scaling as a Useful Tool for Evaluating Progress in Special Education

REY A. CARR

Abstract: Goal attainment scaling is presented as a method to assist special educators to become accountable and effective and to increase the likelihood that special education will become student centered rather than method centered. The method involves devising a set of goals with involved persons, assigning weights to these goals, developing a set of expected outcomes for each goal, scoring the outcomes, and calculating a summary score of the outcomes across the goals. Both individual progress and program effectiveness can be assessed regardless of theoretical orientation. Mutual determination of goals and their weightings insures relevance and meaning to parents, teachers, and students. Visibility and clarity meet administrative needs. The scoring system enables research questions to be answered, while overall evaluation enables administrators to make program decisions. Examples of specific scales applicable to special education are presented and several methods for scoring are illustrated.

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■Special educators are searching for ways of measuring their effectiveness in order to meet the continuing need for accountability. Will it be possible to find methods that can yield reliable and valid assessments without resorting to complex research designs or time consuming evaluation studies? Are there methods relevant to special educators and at the same time meaningful to students and parents?

Procedures discussed in the professional literature (Carr, 1977; Jones, Gottlieb, Guskin, & Yoshida, 1978) are plentiful and diverse yet they often lack simplicity and economy. Methods that are helpful for evaluation often do not satisfy measurement and research standards. Most efforts to report on effectiveness at the local school district level focus on numbers of special personnel, types of activities, descriptions of programs, availability of services, and funds expended. This approach does little to answer the critical question of whether we are providing an *effective* service—one that demonstrates the ability to achieve goals. Methods that do satisfy research and scientific inquiry criteria have been applied to effectiveness questions but they rarely yield a single model that is reusable for a variety of dimensions and outcomes.

Described here is a relatively new system for measuring progress, goal attainment scaling (GAS). This technique, which focuses on outcomes rather than inputs, not only measures individualized progress and class or program achievement but in itself contributes to the attainment of specific goals (Smith, 1976; Cline, Rouzer, & Bransford, 1973). In addition to a description of the system, this article will list the values of goal attainment, illustrate its appli-

cation to special education, and suggest guidelines to guarantee its effectiveness.

GOAL ATTAINMENT SCALING

Initially designed by Kiresuk and Sherman (1968), goal attainment scaling has been used to assess the success of community mental health programs (Kaplan & Smith, 1977; Kiresuk, 1973), and has since been adapted for evaluating the outcome of a wide variety of helping activities, including career education (Cooper, Epperley, Forrer, & Inge, 1977), school counseling (Glicken, 1978; Keelin, 1977), and inpatient psychiatric service (Steinbook, Jacobson, Mosher, & Davies, 1977; Wallin & Koch, 1977).

Basically, GAS involves establishing goals and specifying a range of outcomes or behaviors that would indicate progress toward achieving those goals. Since persons or programs do not always fully realize or achieve their goals, the specified outcomes are placed on a five point continuum, with each position on the continuum assigned a numerical and semantic description corresponding to the degree of achievement toward the goal that each behavior (outcome) represents.

Goal attainment scaling shares a few characteristics with the behavioral objectives approach developed by Bloom (1956) and Krathwohl (1964) and detailed by Gronlund (1978). For example, both systems require that goals be specified and that behaviors indicating the achievement of the goal be described in concrete and measurable terms. While Bloom never discussed placing outcomes on a continuum, Howe and Fitzgerald (1977) showed how goal attainment scaling is compatible with other forms of evaluation including management by objectives. However, there are crucial differences between GAS and other types of evaluation and they will be described in some detail.

FUNDAMENTALS OF GOAL ATTAINMENT SCALING

The most critical requirement of goal attainment scaling is that *goals must be mutually determined* by the persons involved. This insures not only that the goals will be visible but also that they will be relevant. Including persons who will be contributing to the achievement of the goals (the student, parents, teacher, principal) increases the likelihood that the goals will be worthwhile. It also insures a greater degree of cooperation toward achieving the goals because significant others have been included in their construction. Very young children or severely disabled students may be excluded from active participation in goal construction, but they need not be excluded from attempts to help them understand the goals constructed for them. All too often students may be unaware of the goals established for them by professionals. Professionals themselves may have differing ideas about the value of certain goals specified by other helping persons.

Since not all goals will have the same relative importance to the persons involved, a second requirement of GAS is that *goals must be assigned relative weights*. While it is possible that a student might only be working toward one goal, it is more likely that he or she will want to achieve several goals, some of which may be more important than others. Therefore, goals must be weighted and this weighting should also be accomplished by mutual determination. It is possible to record different sets of weightings, however, since teachers and students may have different opinions as to the weight of a particular goal.

Establishing goals is not always an easy task and many factors can interfere with the development of goal statements (Carr, 1977). Kaplan and Smith (1977) found that mental health professionals often had difficulty specifying clinical goals, whereas Cline, Rouzer, and Bransford (1973) discovered that, by clarifying goals, goal attainment scaling contributed to the training and education of therapists.

A third requirement of the GAS system is that the *outcome behaviors must be perceived as best guesses* as to what behaviors can be expected. After the goals are determined and weighted, the helping person makes estimates as to what can be realistically expected as a result of the intervention. These guesses take into account as many factors as possible such as the nature of the problem, resources or time available, and any previous experience. Stating these educated guesses in concrete terms ("The student will make two new friends") as compared to abstract terms ("The student will improve relationships") assists in recognizing when the behavior has been achieved. At the same time, the emphasis is not on the helper's accuracy in predicting behaviors ("It definitely will occur") but on the likelihood that a specific behavior will occur.

Once the expected behaviors are identified, it is necessary to arrange them on a 5 point continuum ranging from better than expected to worse than expected. By exploring with the student better, worse, and expected possible outcomes, the special teacher actually assists the student in learning about alternative behaviors, *clarifies expectations* about what special education can do, and *provides feedback* about the appropriateness of working toward those behaviors. Much of the mystery is removed from the learning process and students, their parents, and teachers may have a much clearer idea about special education. Finally, special educators may be aided in identifying realistic expectations for themselves, since in guessing at outcomes they must also be aware of their own skills and abilities.

A fourth requirement is that *a scoring system must be developed*. This will be described following a specific example of goal attainment scaling.

AN EXAMPLE OF GOAL ATTAINMENT SCALING IN SPECIAL EDUCATION

Let us suppose that a teacher and a student have mutually determined five goals to be attained through a special class setting. These five goals might be improved attending behavior, improved personal grooming, decreased reversals in letters and numbers, reduced errors in number facts, and decreased dependency on the teacher for work directions. Each of these five goals is assigned a weight by the teacher and the student. Each person's weights for the five goals should add to 100. An example of possible weighting is shown in Table 1.

TABLE 1

Weighting Goals

Goal	*Student Weights*	*Teacher Weights*
Improved attending behavior	20	30
Improved personal grooming	15	25
Decrease in letter/number reversals	25	20
Reduced errors in number facts	25	15
Decreased dependency on teacher	15	10
Total	100	100

Asking the student, "How important is goal X to you?" may yield a shrug, whereas rephrasing the question to, "Which one would you like to work on most?" can be helpful. The helper may have to interpret the answers of younger children in order to assign a numerical weight. An alternative way to establish weights would be to rank the goals in order of importance, giving a score of 5 (if there are five goals) to the most important, 4 to the next most important, and so on. While this method does not create numbers that add to one hundred, it is acceptable because it yields a weighted score and demonstrates a creative adaptation of the system to match the student's level of development.

After assigning weights, the teacher breaks down the goals into concrete behaviors. Practically speaking, it is helpful to start specifying concrete behaviors at the "expected" level. This enables the teacher and student to guess at what is reasonable to expect over time, using available resources and methods. It insures that a realistic set of expectations are developed. Possible behaviors are listed in Table 2.

Following the description of the behaviors, the teacher establishes which behavior is illustrative of the present (baseline) situation as indicated by the use of the letter (a) in Table 2. The determination of baseline behavior must be made mutually with the student prior to any intervention. This enables the student to receive feedback from the teacher. Sometimes the teacher's determination of baseline may be influenced by parent observations or psychological reports. Having established which behavior is baseline, the teacher then multiplies the corresponding attainment level (+2, +1, 0, −1, −2) times the weight of the scale, yielding a baseline score. These baseline scores can be summed across scales, yielding a total level at baseline. Using the example from Table 2 the total baseline level equals −145.

Once the baseline is established, the teacher can proceed to the fourth requirement of goal attainment scaling: determining with the student when and how often progress will be monitored. The student and teacher should *mutually establish progress monitoring points*. In the present example, these points were at midterm, end of term, and a three month followup. Each goal scale can yield progress scores at each monitoring point. In this example Scale 3 (letter/number reversals) shows

a baseline score of −40, calculated by multiplying attainment level baseline (−2) times the teacher's weighting of the scale (20); a midterm score of 0, an end term score of 20 and a followup score of 40.

Monitoring point scores for each scale can be summed across scales to yield a total of all followup scores, for example, 30 + −25 + 40 + 30 + 0 = 75. Since this student started at −145 but at followup had changed to a score of +75, we conclude that the Goal Attainment Change Score was 220 points.

TABLE 2

Sample Goal Attainment Scale

Circle whether mutally determined	*Yes* *No*	*Yes* *No*	*Yes* *No*	*Yes* *No*	*Yes* *No*
	Scale 1	*Scale 2*	*Scale 3*	*Scale 4*	*Scale 5*
Attainment levels	*Attending behavior* Student wt. 20 Teacher wt. 30	*Personal grooming* Student wt. 15 Teacher wt. 25	*Letter/number reversals* Student wt. 25 Teacher wt. 20	*Number facts* Student wt. 25 Teacher wt. 15	*Dependency on teacher* Student wt. 15 Teacher wt. 10
Most unfavorable outcome thought likely (−2)	Student is off-task 90% of the time as judged by established teacher criteria.	Student arrives at school with unwashed face, dirty hair, soiled clothes, and dirty hands 5 days per week. (a)	Student reverses b, d; p, q; 6, 9; etc. 90% of the time in written work. (a)	Using precision-teaching beeper, student prints 5 correct answers to multiplication facts.	Needs specific instruction from teacher; teacher must repeat directions 90% of the time.
Less than expected outcome thought likely (−1)	Student is off-task 75% of the time as judged by established teacher criteria. (a)	Student arrives at school with unwashed face, dirty hair, soiled clothes, and dirty hands 5 days per week. (b) (c) (d)	Student reverses b, d; p, q; 6, 9; etc. 75% of the time in written work.	10 correct answers. (a)	Needs specific instruction from teacher; teacher must repeat directions 75% of the time. (a) (b)
Expected outcome thought likely (0)	Student is on-task 50% of the time. (b)	Student arrives at school with washed face, clean hair 3 days per week.	By tracing in damp sand, blindfolded or with eyes closed, student prints letters with no reversals. (b)	20 correct answers.	Student begins work, asks for specific instruction when teacher is available 50% of the time. (c) (d)

continued on next page

TABLE 2 Continued

More than expected outcome thought likely (+1)	Student is on-task 75% of the time. (d) (c)	Student arrives at school with washed face, clean hair, fresh clothes, and clean hands 4 days per week.	Reversals sometimes occur but student uses "eyes averted" technique to self correct. (c)	30 correct answers. (b)	Student begins work; asks for assistance when unclear or confused and when teacher is available 75% of the time.
Most favorable outcome thought likely (+2)	Student is on-task 90% of the time.	Student arrives at school with washed face, clean hair, fresh clothes, and clean hands 5 days per week.	Reversals rarely occur in student's written work. (d)	Using precision-teaching beeper, student correctly prints answers to 50 multiplication facts per minute. (c) (d)	Student begins work, asks for assistance when unclear or confused and when teacher is available 90% of the time.
Level at baseline (a)	(−1×30) = −30	(−2×25) = −50	(−2×20) = −40	(−1×15) = −15	(−1×10) = −10
Level at midterm (b)	(0×30) = 0	(−1×25) = −25	(0×20) = 0	(+1×15) = 15	(−1×10) = −10
Level at endterm (c)	(+1×30) = 30	(−1×25) = −25	(+1×20) = 20	(+2×15) = 30	(0×10) = 0
Level at followup (d)	(+1×30) = 30	(−1×25) = −25	(+2×20) = 40	(+2×15) = 30	(0×10) = 0

Improvement Scores

An alternative method for calculating change has been devised by Romney (1976). Instead of the attainment levels being described as −2, −1, 0, +1, +2 and labeled as "most unfavorable outcome thought likely" and so on, the levels are labeled Level 1, 0% improvement; Level 2, 25% improvement; Level 3, 50% improvement; Level 4, 75% improvement; and Level 5, 100% improvement.

The improvement score indicates the degree of success the teacher has had with a particular student in achieving the goals. The goal weights are now multiplied by the percentage improvement score, yielding a weighted score for each goal and, summing these yields, an overall improvement score.

Suppose that a student and counselor have established three goals as illustrated in Table 3: reducing absenteeism, improving grades, and decreasing alcohol use, and they have weighted them 20, 50, and 30 respectively. If, following counselor intervention, the student went to school 3 days a week we could say this would be a 50% improvement and 5 days a week would be a 100% improvement. If grades went from F's to C's this would be a 50% improvement. It is still possible to guess what the expected outcome is because while it would probably be unrealistic to expect the student's grades to go from F's to A's, improvement from F's to C's might be expected.

An overall improvement score would be determined by:

Weighted score on absenteeism (3 mos.)	= .25 × 20 =	5.00
Weighted score on grades (3 mos.)	= .25 × 50 =	12.50
Weighted score on alcohol (3 mos.)	= .50 × 30 =	15.00
Overall improvement score	=	32.50%

We would conclude that the overall improvement score lies between slight and moderate improvement. This improvement could have been different if the goals were weighted differently or a longer period of monitoring had taken place.

Using improvement levels (as compared to expectancy levels) may be advantageous when behaviors can be clearly described in a numerical fashion (number of days absent, grade point averages, number of drinks per day, etc.) or when it is clear that the behavior described is not likely to get worse or is already at rock bottom.

Both the improvement and progress score methods described here differ in their statistical properties from the standardized or T-score method devised by Kiresuk and Sherman (1968) where scores from individual scales are converted to standard scores (mean equal to 50, standard deviation equal to 10). While their procedure enhances the statistical validity of summing scale scores or measuring changes over time, the determination of pooled and realistic expectations by the learning team accomplishes much the same result.

Program Goal Attainment

Examples so far have centered on assessing individualized progress and, indeed, this is an important aspect of goal attainment scaling. Yet what is unique about this system is that it allows individual progress and program progress to be assessed at the same time. The *change scores or overall improvement scores are independent of the specific goals chosen or the theoretical and methodological approaches taken.* While it may turn out that individual students are working toward similar goals, making some standardization possible, it is more likely that individual teachers, students, and counselors will be working on goals uniquely tailored to their needs, thus prohibiting comparisons in the traditional evaluative methods.

Using the improvement score method, we can calculate overall improvement scores for each student and keep track of class, group, or school progress by recording the frequency of occurence of different improvement scores:

TABLE 3

Goal Attainment Scale: Using Improvement Scores

Attainment levels	*(W = 20) Absenteeism*	*(W = 50) Grades*	*(W = 30) Alcohol*
0% improvement	Absent 5 days average per week	F grade average	Drinks during and after school
25% slight improvement	Absent 4 days average per week*	D grade average*	Drinks after school and on weekends
50% moderate improvement	Absent 3 days average per week	C grade average	Drinks on evenings occasionally*
75% marked improvement	Absent 1–2 days average per week	B grade average	Drinks on weekends occasionally
100% total improvement	Absent 0 days per week	A grade average	Drinks rarely during school term

* Indicates score after 3 months of intervention.

	Slight	*Moderate*	*Marked*	
Overall improvement	0–24	25–49	50–75	76–100
Number of students	3	7	15	1

This description shows that our special education program seems to help students make moderate changes, and if we continue to record these data we will be able to keep an up-to-date record of our success rate. Further examination of the goals of students at the "slight improvement" end of the scale might reveal that those students had specific problems in common, for example, low grades. This would help us to see directions to pursue in order to strengthen our service. In a special class it might enable us to see that student interpersonal development goals did not improve much, indicating the need to improve our resources and skills in this area.

The same overall program assessment can be made using the expectancy levels. A frequency table can be constructed similar to this one:

	Most Unfavorable Outcome	*Less than Expected*	*Expected*	*More than Expected*	*Most Favorable Outcome*
Overall change	(−100)-(−1)	0–99	100–199	200–299	300–400
Number of students	1	3	26	17	10

The numbers given here are, of course, hypothetical and are presented to illustrate the use of these scores to evaluate program success. Again this method can be used not only to evaluate the program as a whole but also to determine which problem(s) the program is most (least) effective in helping. In addition, differing methods of intervention can be compared on an individual program basis. Teachers can also assess the accuracy of their expectations and the proficiency of their skills. Other intriguing uses would be to compare expectations of professional staff with expectations of parents or to compare outcome progress between students whose involvement has been maximized and those who were uninvolved in the scaling.

VALUES AND GUIDELINES

A major value of GAS is that it is independent of the theoretical predispositions or methods used by the helping person; therefore it can be used by a wide variety of persons with different training and interests. Special classes, self contained classes, activity centers, and individualized educational programs can all be integrated into a comprehensive evaluation system, allowing flexibility and visibility in program description. GAS may improve inservice education of teachers since it helps them clarify specific problems and point out directions for action. Displaying individual guides enables students to inform themselves about common and individual goals, encourages cooperative behaviors, and may support self responsible progress. In a project supervised by the author, the time necessary to construct the scales (30 to 60 minutes per student) was seen as worthwhile by special educators who found that by specifying goals they were able to integrate other school personnel such as counselors, psychologists, and regular classroom teachers in the special education program.

As with many other evaluation systems, it might be possible to use separate aspects of this system by themselves, but the crucial element of this approach is its simplicity and the involvement of the people it is designed to help. While participation of severely disabled youngsters in the steps of this method would be limited, the teacher of these students need not be discouraged from drawing on experience, research, and others' hopes for the student, to develop a useful way of measuring student progress.

Perhaps today's education system can be characterized as method centered, that is, addicted to methods and only secondarily concerned with students. Goal attainment scaling, however, is a *student centered method* and therefore has value for both student centered and method centered educators. In addition to providing information on the effectiveness of a variety of methods and facilitating decision making in planning, this system also provides students a much needed opportunity to participate in the evaluation process. Hopefully the system will encourage the development of student centered special education.

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Effects of Goal-Setting and Monitoring Procedures on Teacher Decisions

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Running Head: Goal-Setting and Monitoring Procedures

Abstract

The study examined effects of goal-setting and monitoring strategies on teachers' long- and short-term estimates of student achievement, their satisfaction with students' programs, and their modifications in students' programs. Subjects were 20 special education teachers, each of whom selected three or four students for participation in the study. Teachers were assigned randomly to a treatment: Short-Term Goal Monitoring (STGM) or Long-Term Goal Monitoring (LTGM). Analyses revealed that the teachers' long-term estimates of student achievement were unrealistically high and similar in both treatment groups. Yet, their short-term estimates were conservative, but more optimistic and accurate in the STGM group. Additionally, the STGM teachers were more satisfied with their students' programs and introduced fewer programmatic changes. Implications for goal-setting and monitoring strategies are discussed.

Effects of Goal-Setting and Monitoring Procedures on Teacher Decisions

Theoretical and empirical work tends to substantiate the importance of establishing clear student-centered goals in order to direct teaching and curriculum development, to guide learners, and to structure evaluation (Fuchs & Deno, 1982). Furthermore, for handicapped students, PL 94-142 (1975) requires that educators set annual goals and short-term objectives as well as monitor student progress towards goals and objectives.

Despite both the apparent usefulness of goal setting and the Federal mandate to establish and monitor progress towards goals, there is a noticeable lack of agreement concerning either appropriate scopes for goals (Tymitz, 1981) or effective goal-monitoring procedures (Fuchs, Fuchs, & Warren, 1982). The purpose of the current study was to contrast the effect of two goal-setting and monitoring procedures on special educators' teaching decisions. Specifically, the investigation compared how long- and short-term goal-setting and monitoring procedures affect teachers' (a) long- and short-term estimates of student achievement, (b) satisfaction with students' programs, and (c) adjustments in students' programs.

Method

Subjects

Twenty special education resource teachers from a midwestern metropolitan area volunteered to serve as subjects in the study. These teachers (2 males, 18 females) had taught school for an average of 9.6 years (SD = 6.9). Each teacher selected three or four students

from his/her caseload, resulting in a student sample of 53 boys and 15 girls. The students' mean age was 10.3 years (SD = 1.9); their mean grade level was 3.9. Each child had been labeled as mildly to moderately handicapped and was reading at least 1.5 years below grade level.

Procedure

Experimental conditions. Teachers were assigned randomly to a goal-setting and monitoring treatment group: Long-Term Goal Monitoring (LTGM) or Short-Term Goal Monitoring (STGM). In the LTGM condition, teachers set and monitored students' progress toward 12-week reading goals. They tested students' performance by frequently administering a 30-second word recognition test comprised of 25 words randomly selected from a large set of vocabulary words to be introduced within a 12-week period. At each measurement session, teachers graphed the students' performance; every sixth through ninth day, the teachers reviewed each graph. If graphed data indicated that progress was insufficient in order to meet the 12-week goal, then the teacher introduced an adjustment in the student's program in an attempt to improve the effectiveness of the instruction. Every 10 days, teachers were required to make an adjustment if one had not been made previously, in order to try to stimulate even greater student achievement.

In the STGM group, teachers set both 12-week and a series of weekly goals, but monitored students' progress only the the weekly reading goals. They tested students' performance by frequently administering a 30-second word recognition test comprised of the new

vocabulary words introduced in the current instructional lesson plus words sampled from preceding stories, for a total of 25 words. Teachers graphed the student's performance and compared that performance against a short-term aim line, which the teachers drew on the graph each time a new short-term goal was established. Teachers reviewed graphs frequently to determine when to move to the next story and/or when to make a program adjustment.

Training. Training primarily was accomplished via self-instructional manuals, each of which was written expressly for an experimental condition. Each manual consisted of six chapters. Only two chapters, "Measuring Students" and "Recording and Graphing Data," differed for the experimental groups. Each chapter in the manuals concluded with a mastery test.

At the first of two 1 1/2 hour sessions, teachers were trained in procedures for placing students in reading curricula (see Mirkin, Fuchs, Tindal, Christenson, & Deno, 1981, for procedure). Before the second training session, teachers placed students according to the procedures and completed reading and answering questions in the training manuals. At the second training session, manual mastery tests were scored. Additionally, teachers established goals as instructed in the manual and submitted a 12-week goal along with a list of all vocabulary words covered in the goals. These words were made into flash-card packs for use in measurement.

Teacher visits. One week after the second training session, a graduate research assistant (RA) delivered flashcard packs to each teacher and helped the teachers set up student graphs. The teachers

then began to implement the monitoring strategies.

An RA was assigned to each teacher; over the 12-week treatment period, RAs made weekly 10- to 20-minute visits to teachers. During each of those visits, the RAs provided additional training as required, and recorded information on an interview checklist. On this checklist, the following information was recorded: (a) teachers' estimates of students' long-term achievement, (b) teachers' short-term estimates of student performance, (c) teachers' level of satisfaction with student programs, and (d) how and when teachers introduced adjustments into students' programs.

Results

Long-Term and Short-Term Estimates of Student Achievement

Long-term estimates. Long-term estimates were the number of words teachers predicted students would master in 12 weeks. The mean number of revisions in long-term achievement estimates was compared for the STGM and LTGM conditions; a *t* test revealed no significant difference. Teachers typically made from one to three revisions.

Teachers' long-term achievement estimates for each student were averaged across the 12 weeks. The number of words that the teachers had predicted would be mastered was similar for the STGM and LTGM conditions. At the end of the 12-week period, teachers reported the number of words each student actually had mastered in his/her curriculum; a *t* test revealed no statistically significant difference between the STGM and LTGM groups.

The accuracy of teachers' long-term achievement predictions was defined as the difference between the number of words actually

mastered and the average prediction for each subject. These differences were subjected to a *t* test, which revealed no statistically significant difference. Teachers in both groups predicted that students would master more words than they actually did master.

Short-term estimates. Short-term estimates were the teachers' predicted median levels of words correct and errors over upcoming program phases. These predicted median levels of performance were significantly different for students in the two groups, $t(66) = 4.38$, $p < .001$ for words correct, and $t(66) = 3.11$, $p = .003$ for errors. The STGM teachers predicted more words correct ($X = 25.6$ vs. 19.1) for fewer errors ($X = 1.7$ vs. 2.7) than the LTGM teachers.

An analysis of the accuracy of these predictions also was performed. Accuracy was defined as the difference between a teacher's prediction and the student's obtained score. The STGM teachers underpredicted students' correct performance by an average of .21 words; the LTGM teachers, an average 1.61 words. Teachers predicted words correct more accurately for students in the STGM group than for those in the LTGM group, $t(66) = 4.1$, $p < .001$. Similarly, error predictions were more accurate for students in the STGM group, $t(66) = 5.1$, $p < .001$, with the STGM teachers underpredicting errors by an average .07 words and the LTGM teachers underpredicting errors by an average of .49 words.

Satisfaction with Students' Programs

Each week teachers expressed their level of satisfaction with the effectiveness of the previous week's program for each student. There

was a statistically significant relation between treatment and the frequency with which programs were judged effective, $X^2(6) = 29.12$, $p < .001$. STGM teachers expressed greater satisfaction with the effectiveness of their students' programs more frequently than the LTGM teachers.

Adjustments in Students' Programs

During the weekly visits, RAs determined whether teachers had made an instructional change, a motivational change, or a physical arrangement change in their students' programs. Teachers made a greater percentage of instructional changes than any other type of change.

During more weeks, a greater percentage of STGM teachers maintained their students' programs without introducing any changes, $X^2(7) = 48.5$, $p < .001$. Additionally, for changes that were made, motivational changes were made more frequently by teachers in the LTGM condition, $X^2(6) = 22.3$, $p = .002$.

Discussion

In the present study variations in goal-setting and monitoring procedures did not affect teachers' long-term estimates of student achievement. Teachers made one to three revisions in their long-term achievement estimates, and the accuracy of those long-term estimates was similar. Both sets of teachers overpredicted the number of words that would be mastered in 12 weeks.

While teachers' long-term estimates of student growth tended to be unrealistically high, their short-term estimates were conservative; that is, both groups of teachers underpredicted the number of correct words students would read during the upcoming program phases.

However, the teachers who monitored short-term goals predicted that their students would read more words correct and make fewer errors than the teachers who monitored long-term goals predicted for their students. Further, the predictions of teachers who monitored short-term goals were more accurate. Consequently, it appears that teachers who monitored students' attainment of a series of short-term objectives, which changed approximately weekly, predicted performance more accurately and less pessimistically than their counterparts who monitored students' progress on a larger pool of material representing a 12-week goal.

In addition to their better and more realistic predictions of short-term performance, the teachers who monitored short-term goals judged more often that their students' programs were effective. Therefore, they felt more satisfied with their students' programs and this greater satisfaction may have been realistic given the fact that the short-term goal monitoring teachers predicted short-term success more optimistically and accurately.

The short-term goal monitoring teachers' greater satisfaction may have contributed to their making fewer changes in their students' programs. Teachers who monitored short-term goals were free to modify programs as frequently as they deemed necessary to ensure that their students would reach goals. On the other hand, the teachers who monitored long-term goals were required to modify programs at least every 10 days in order to stimulate ever-increasing student achievement. Teachers who monitored long-term goals introduced more changes in their students' programs, and made a greater percentage of

motivational changes than did the teachers who monitored short-term goals. These motivational changes largely were directed at increasing student performance on the measurement task rather than at substantially improving students' reading. For instance, these teachers frequently changed their students' programs by introducing reinforcement for increasing words correct on the 30-second word reading test. Therefore, it is not surprising that, despite the greater number of programmatic adjustments in the long-term goal monitoring group, students in both conditions achieved similar amounts during the study. Perhaps if these teachers had chosen more substantial programmatic changes, they would have been successful at stimulating greater student achievement.

Whereas teachers' long-term estimates of student achievement did not differ as a function of their goal-setting and monitoring procedures, other decisions did differ. Teachers who monitored performance on a series of short-term objectives and who were free to modify programs as frequently or infrequently as necessary: (a) were more accurate and optimistic about students' short-term achievement, (b) were more satisfied with their students' programs, and (c) made fewer total modifications and a smaller percentage of motivational changes in their students' programs as compared with teachers who monitored progress on long-term goals and who were required to modify student programs at least every 10 days.

On the basis of these findings, one might conclude that goal-setting and monitoring procedures affect special educators' decisions. More specifically, these findings suggest that monitoring student

performance on short-term, rather than long-term, objectives may result in more correct, optimistic assessments of students' short-term progress programs. One might expect such accurate assessments to lead to improved student growth. However, it is important to note that the differential teacher decision making demonstrated in this study was not associated with differential student achievement. Perhaps an important focus for additional work is the development of strategies for teachers to implement their data and assessments to effect improved students performance.

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An Investigation of Student-Selected Instructional Planning

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Key Words: Objectives, goal setting, individualized, programmed, accountability

Abstract: Two studies were conducted to determine: a) if procedures could be developed by which school-age children, kindergarten through twelfth grade, could express educational objectives and standards of performance in behavioral and measurable terms, and b) if, after instruction, teachers could apply the procedures to eliciting behavioral objectives from students. The data indicated that, with limited assistance, students could state their goals in measurable terms, and that, with instruction, teachers were significantly more skilled in eliciting behaviorally stated objectives from their students.

TWO DISTINCT TRENDS are evident in current educational practice at the secondary and elementary levels: the learner-selected experience and the adult-selected experience. Unfortunately, these contrasting orientations have tended to polarize professional practice, with proponents of each position claiming a preponderance of literature supporting their philosophical or procedural stance. While the differences between the two approaches have received a great deal of attention, little has been accomplished in terms of resolving the differences through the analysis and application of variables common to both, such as the emphasis on individualized instruction, the direct concern with student motivation, and the reliance on objectives for the specification of curricula (12, 13).

The most significant points of potential agreement between the two approaches are the use of objectives for the planning of educational experiences and the consideration of the learner as a source of direction. As noted by Macdonald, "Purposes arise *from* the subject whom, it is implied, intentionally seeks some end (7)." However, unless such purposes are specified and objectives measured, no analysis of educational progress can be made.

The need for specific objectives is apparent, and the desirability, if not necessity, of student involvement in the specification of these objectives has often been expressed by proponents of both positions. Yet, what educators advocate and what they practice are frequently quite different:

> Researchers have not shown a workable method by which instructional objectives can reflect objectivity. There is no system for collecting the comprehensive range of facts from which more valid inferences and objectives can be derived. Personal bias and power remain the chief determiners of educational objectives. This is true of the formulation of educational objectives at a national level . . . and at the classroom level where the teacher selects objectives for individual pupils (8).

Thus, while there has been extensive effort expended in the definition and clarification of objectives and considerable research into their value in the educational enterprise, there has been a crucial constraint on this inquiry in that the *sources* of the objectives have invariably been professional, adult authorities (9). That is, the range of alternative procedures for generating or deriving objectives can be partitioned into four basic categories: teacher-stated, teacher-selected, student-selected, and student-stated. The first three sources of objectives are all adult initiated and have been the source for all published studies of objectives in education (2, 4).

A major deficit exists in procedures for actively involving the learner in the process of educational deci-

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sion-making, in terms of identifying substantive curricular objectives, and of establishing criteria of performance. In response to this need, research was initiated: a) to determine if procedures could be developed by which students in both open and traditional schools could effectively state their educational goals and standards of performance in behavioral terms, and b) to determine if teachers could better apply the derived procedures after receiving instruction on student goal-setting procedures (9, 11).

Study I

A basic premise of this study was that "schools" can be defined by their approaches to curriculum. As noted by Joiner ". . . curriculum approaches can be divided into two basic categories: a) have students learn basic subject matter that has been carefully planned and sequenced (teacher-selected) . . . or b) arrange a variety of learning experiences for students in which they practice skills needed in their daily life and learn subject matter as needed to carry out projects of interest to them (student-selected) (6)." The fact that students from an open school (as defined by the latter curriculum approach) might have a unique history of self assertion in determining learning experiences suggested the value of deriving the principles for student goal setting based on the responses of students in "conventional" schools (as defined by the first curriculum approach) as well.

To investigate the generalizability of procedures developed for eliciting behavioral objectives, an open school in the St. Paul, Minnesota School District was matched with traditional schools having equivalent grades on the basis of socio-economic levels and characteristics of attending students.

Method

Subjects. Three students were randomly selected from each grade equivalent in an open school, kindergarten through grade twelve (K-12), and three from each grade in comparable traditional schools (elementary, junior, and senior high).

Because of the commitment of the administration, staff, and parents to student-directed education, the St. Paul Open School was selected as the site for both the initial investigation as well as for the later implementation of the resulting instructional program for teachers. The 500 students enrolled in the Open School were deliberately selected from the application list of 955 volunteer families so as to be representative of the range of ages, racial and ethnic groups, socio-economic status, and areas within the city.

To insure the representation of students from "teacher-managed" programs, the present investigators, with the assistance of the Administrator for Instructional Research and Evaluation for the St. Paul Public Schools, identified traditional schools, including grades K-12, in which the characteristics of the students would be equivalent to those enrolled in the Open School.

Procedure. The first author, who was an expert at writing behavioral objectives and had pilot tested the interview technique (9), served as investigator. Students were interviewed in a private room in their schools, with a 15-minute maximum set per interview. Since student responses were necessarily open-ended, each interview was taped and transcribed.

After discussion related to the student's current activities was initiated, the investigator proceeded to ask the questions related to the student's goals, i.e., If you could learn anything, what would you want to learn how to do? If a student could not respond to the question, the investigator stated a simplified form, i.e., What would you like to learn to do? If the student responded to a question with a behavioral statement or an area of study, the investigator proceeded to the question related to measures, i.e., How would you measure your success? Again, if the student could not respond to a given question, the question was stated in a simplified form, i.e., How will you know when you can do it well? The interview was considered completed when the student indicated a behavior he wished to develop and a procedure by which his success could be evaluated, or when the student had been asked the simplified form of each question but continued to respond nonbehaviorally.

Two individuals having expertise in the area of writing behavioral objectives and a combined history of greater than 15 years of teaching experience were selected to evaluate the student responses. To promote consistent use of the criteria for evaluation, each judge completed a previously tested program on writing and modifying objectives.

After the student responses were transferred to 5" x 8" cards coded to indicate grade and school, each judge independently rated the student responses using four criterion questions: 1) Is the outcome stated as an observable and measurable behavior?; 2) If not, could a teacher independently restate it in this form or reduce it to smaller behavioral units without losing the student's intent?; 3) Could a quantity or level of quality be set using the student's measure for evaluation?; and 4) Would the measure require teacher input in establishing limits or criteria?

The percentage of agreement between the ratings of the two judges was then calculated for each question by dividing the total number of student responses on which the judges agreed by the total number of student responses rated.

Results

Sixty-one of the 78 students (78%) responded with statements of observable, measurable behavior. The agreement between the primary judges in rating the students' responses of these questions was 95%. A review of the individual items which were judged to be nonbehavioral indicated that eight students stated a *general verb;* six students responded with statements related to general skill areas, e.g., "painting," "sign language," "experimental work," and "better dancer;" and three students responded with long-range goals in the form of

vocations. The distribution of nonbehavioral goal statements was almost equally divided between open and traditional school students, and there was a slight tendency for nonbehavioral goal responses to be offered by middle- and upper-grade students. In the Open School, nonbehavioral responses occurred with a frequency of zero at the K-4 grade level, four at the 5-8 grade level, and four at the 9-12 grade level (total of 8); in the traditional program, nonbehavioral responses occurred with a frequency of one at the K-4 grade level, three at the 5-8 grade level, and five at the 9-12 grade level (total of 9).

In those instances where the student did not respond with a behavioral statement, could a teacher restate it for the student without losing the student's intent? Of the 17 responses which were judged to be nonbehavioral, the primary judges agreed (100%) that all could be restated behaviorally or reduced to small behavioral units by a teacher without distorting the student's intent. In other words, with limited interpretation, all of the student's goals could have been stated in behavioral terms.

Can students establish procedures for evaluation of their performance? The data indicated that 75 of the 78 students (96%) established measures which could be used to evaluate the quantity or quality of their performance. (The level of agreement between judges was 99%.)

Do students need assistance in establishing criteria for the evaluation of their performance? While students can establish viable measures of their performance, in many instances they might need assistance in establishing realistic criteria or limits. Of significance, then, was the number of student responses which would require teacher input for establishing realistic criteria for success. The primary judges agreed (96%) that 20 of the 78 measures established by students would require teacher input in establishing criteria or limits by which performance could be evaluated.

When viewed as a composite set, these data indicated that, with limited assistance, students could state their goals as behavioral objectives – a prerequisite to educational planning.

Study II

In Study I a procedure for eliciting behavioral goals was established, but the success of the questioning procedure was confounded with the expertise and experience of the investigator. Therefore, the crucial questions of the generalizability of the procedure and of teacher implementation were addressed. The immediate formulation of the problem was, "Will *teachers* be able to elicit precise objectives from students after completion of an instructional program on the derived goal-setting procedures?" A positive answer would appear to indicate that the procedure could be a tangible contribution to resolving the "managerial problem" of open education. Fiske has noted that, "the running of an individualized instruction program—one where hundreds of decisions can be made daily about the educational needs of a single class--is no mean managerial feat (3)." With a common communication and reporting system established, monitoring and assessing individual and programmatic achievements would be conceivable.

Two major factors were identified as potential sources of variability in evaluating the effectiveness of the instructional program: teacher attitude and the ages of the students interviewed. Each of these factors was considered in the research design.

Because a distinct set of principles for eliciting behavioral objectives had been derived, e.g., the action, the criterion-measure, and the conditions of performance (9, 11), the procedures were converted into a programmed text using a "rule-example" format, COREX (10). The programmer identified and recorded the principles of student goal setting based on the outcomes of Phase I interviews and on his knowledge in the area of writing behavioral objectives. The logically sequenced principles were then incorporated into programmed frames including: a) rule presentation, b) example presentation, c) a question related to the rule, d) feedback on the response with explanation, e) a simulation problem, and f) criteria by which to evaluate the simulation.

The primary emphasis of the programmed course was deliberately placed on applying specific procedures to elicit objectives from students. In other words, while the procedure would be potentially applicable to any classroom (e.g., in regard to optional or free-time activities) the orientation was toward initial implementation in "learner-managed" environments where student involvement in curriculum-setting was already an accepted principle. Consequently, to avoid complicating the *developmental* test of the instructional program by incorporating teachers who might be attitudinally opposed to the general concept underlying the procedure, all teachers were selected from an open-school program whose 23 teacher-advisors had been screened, in part, on the basis of their commitment to fully individualized student programs.

The fact that teachers in an open school might already have acquired many of the skills required for eliciting objectives necessitated that a control group be established. As noted by Hively, et al, "When one is primarily interested in finding out what the curriculum can do and whether it satisfied its own objectives, control groups are not useful. (However) . . . if there is a suspicion that some objectives of the curriculum might be met were no instruction given at all, then there might be value in choosing a group . . . who have not been taught that topic formally and testing their knowledge for comparison (5)."

To control for the effects of students' ages, the two groups of teachers were subdivided by the age level of the students they advised: *Lower*—grades one through four, *Middle*—grades five through eight, and *Upper*—grades nine through twelve.

Method

Subjects. The present investigators randomly selected, from the 23 available advisor-teachers, four teachers from each of the three groups, i.e., lower, middle, and upper; assigning two teachers to the experimental group and two to the control group. The teachers in the Open School had a large role in decisions related to expectations of them and their daily activities in regard to both teaching and advisory activities. Consequently, teachers were not required to participate in the experiment, nor was any administrative "pressure" placed on them to be involved. One teacher from the experimental/lower-grades group withdrew from the experiment for lack of time and was replaced by random selection of a new teacher from that pool.

Three students were then randomly selected from the advisees of each teacher involved in the study. To eliminate the possible effects of student experience in goal-setting conferences, students who had participated in Study I were not included in the sample.

Procedure. The teachers were asked to interview the three students, to assist them in setting goals, and to record the results of the goal-setting conferences on a form adapted from the schools' student project report form.

After all teachers had completed the interviews with the selected students, teachers in the experimental group were asked to complete an instructional program, *Student Goal-Setting* (11). Consistent with the design of the materials, the teachers were asked to complete the program at their own pace.

When the instructional programs from the six experimental teachers were completed and returned, three students were randomly selected from the remaining advisees of each teacher in both the experimental and control groups and goal-setting interviews again were conducted.

Results

Scoring and Reliability. Two judges independently rated each response in terms of criteria based on the types of goals which might be derived in a goal-setting conference and their relative usefulness for educational planning. Pearson product-moment correlations computed on the two judges' ratings of the pre- and post-test objectives elicited by each of the 12 teachers ranged from 1.00 to .77, with the median correlation being .95.

For purposes of data analysis, the student responses were weighted numerically to indicate the degree to which behavioral criteria were met: a) 4 points, measurable action, short-term goal; b) 3 points, nonmeasurable (modifiable) action, short-term goal; c) 2 points, measurable action, long-term goal; d) 1 point, nonmeasurable (nonmodifiable) action, short-term or long-term goal; and e) 0 points, no goal elicited.

Judgments of the student objectives required that working definitions be created for each of the preceding terms. "Short-term goal" was defined as a goal the student could reasonably complete during a school year. "Long-term goal" was defined as a goal the student could not reasonably complete during a school year. The criteria for a "measurable action" was an action that, if 10 people saw it, all would agree as to what had occurred. The definition of a "modifiable action" was an action that is nonmeasurable as stated, but one that could be modified by the teacher without losing the student's intent.

Measures of detecting attainment: a) 2 points, appropriate measure for action, standards could be set for; b) 1 point, appropriate measure for action, standards *could not* be set for, *or* inappropriate measure for action, standards *could* be set for; and c) 0 points, no evaluation elicited.

"Appropriate" was defined as a measure by which the specific action could be realistically evaluated, and "standards could be set" was defined as a measure for which a precise quantity/quality of performance could be specified.

Data Analysis. The primary purpose of the research in Study II was to determine if teachers completing an instructional program on the derived goal-setting procedures could elicit precise objectives. The analysis of the program was based on the pre-test and post-test performance of experimental and control teachers from primary, middle, and upper grades in the Open School.

Eliciting two goals from each of three students, each teacher-subject could achieve a maximum score of 36, i.e., 4 points per action and 2 points per measure on two objectives for three students. The scores of all students interviewed by each teacher in both groups were tallied to create a composite score and a three-factor [2 (experimental vs. control) x 3 (primary, middle, upper) x 2 (pre- vs. post-test)] analysis of variance was completed on the data. The analysis of variance revealed that only the interaction of conditions x trials was significant ($p < .05$) indicating that performance across trials was different for the two groups, i.e., the ability to elicit behavioral objectives was influenced by instruction (see table).

A review of the mean scores (see table) indicated that the performance of the experimental group was markedly improved by instruction, as contrasted to a 1.3 point decrease by the control group. An additional analysis was completed to determine the number of complete objectives, i.e., objectives including both a measurable behavior and an adequate measure, elicited by each teacher in the experimental and control groups on the pre-test and post-test. The analysis indicated that each teacher in the experimental group increased the number of elicited objectives meeting both criteria on the post-test by two or more over pre-test performance. The largest gain of any teacher from the control group was an increase over pre-test performance of one objective meeting both criteria. The performance of other control group teachers either remained constant or showed a decrease from the pre-test to the post-test.

Program Efficacy. The program proved to be extremely efficient. The total amount of teacher-trainer time consumed in presenting instructions for completion

Table. Mean scores on the pre- and post-test for the experimental and control groups

		Trial			
		Pretest		Posttest	
Condition	Level	Level $\bar{x}$	Condition $\bar{x}$	Level $\bar{x}$	Condition $\bar{x}$
Experimental	Primary	30.5	27.8	35.0	32.3
	Middle	27.5		32.0	
	Upper	25.5		30.0	
Control	Primary	29.0	28.3	29.0	27.0
	Middle	25.5		22.0	
	Upper	30.5		30.0	

of the program was 30 minutes; the time required by teachers to complete the program ranged from 2 to 4.5 hours ($\bar{x}$ = 2.8 hours). Further, two program objectives were elicited from each student during a period not greater than 15 minutes indicating the practicality of the procedure for classroom application.

Discussion

The results of Study I demonstrated that a large majority of children from five through 18 years of age, the entire school-age span, could state an educational goal and standard of achievement in behavioral terms under appropriate eliciting conditions. The Study II field test indicated that, after instruction via a programmed course, teachers were able to effectively apply the procedures in eliciting behaviorally-stated objectives from their students.

Combs stated that "the humanist approaching educational accountability finds himself in a difficult spot. On one hand he finds it necessary to resist the distortions produced by preoccupation with performance-based criteria as educational outcomes. . . . On the other hand, the humanist finds himself unprepared to offer immediate or simple solutions to the processes of accountability (1)." The present research would suggest that the problem need not go unresolved—what could possibly have more meaning to a learner than his personal objectives and what better source of accountability than learner objectives stated in behavioral terms; not a rigid set of imposed objectives, but rather a flexible, changing set of guides which reflect how the learner ". . . sees himself, how he sees the world in which he is moving, and the purposes he has in mind (1)."

While contributing to the resolution of the accountability problem in learner-selected programs is a significant outcome, the most important result of the investigation is the potential of the procedure for establishing program objectives with learner involvement—a problem which has been consistently confronted by curriculum developers (8, 14). If systematically applied, individualized objectives can be derived for all students, thereby providing structure for curriculum development and planning, e.g., given behaviorally-stated objectives, teachers can bring their expertise to bear in guiding students in setting priorities, selecting activities, and sequencing experiences. Further, all of the advantages attributed to objective-based programming might be realized in a learner-selected program.

Improved Communication. Extensive reliance on the use of terms such as "feeling," "understanding," and "awareness" can only serve to foster differing interpretations of what a learner is attempting to accomplish. Precise student-stated objectives can facilitate adequate communication by interpreting these personal outcomes in observable form, i.e., if the learner is aware of something, he will demonstrate it; if the learner feels differently, he will show it.

Effective Selection of Experiences. The student in a self-selected program may be limited by a narrow repertoire of personal experiences which suggest the means for meeting his objectives. In view of this, the best alternative is a cooperative student/teacher selection of activities, a natural outcome of goal-setting conferences.

Relevance to the Learner. Learner-stated objectives provide an accountable alternative to teacher-directed programs and assure relevance of the instructional program to the learner, i.e., the program is derived from the learner.

Experience Appropriate Evaluation. The absence of measurable objectives in student-selected programs often leads to capricious evaluation based on arbitrary objectives or to the elimination of evaluation which could provide the student with feedback as to how well work is being done in a given subject area (short-term goals), as well as with information related to status across all areas (general goals). The results of evaluation based on precise student-stated objectives can provide the student and the teacher with necessary information for building activities, for selecting experiences, and for determining when activities are successful.

Indicators of Progress. Within a framework of sequentially arranged objectives, each student could come to have a unique approach to education and, indeed, life, broadly reflected in a succinct but specific performance profile. Such a cumulative record of personal, tangible achievements would be an increasingly reliable indicator of the interests and abilities of the developing individual, as well as of previous educational experiences and probable future needs.

Existing data demonstrate that behavioral objectives can serve a number of planning and instructional purposes. While conducting the study, however, we noted three common objections to their use which were often raised, regardless of the source of the objectives. It would appear appropriate, therefore, that these concerns be addressed briefly.

Objections to Objectives

It was suggested that through the use of behavioral objectives *all students would be required to learn the same things.* But that would be true only if identical

goals are imposed on all of them. Thus, there is a greater likelihood that students in programs having pre-set objectives will be required to master similar skills regardless of the individual student's interest or need for those skills. Individual goal-setting, as described in this study, is a unique individual process, and the goals each student selects to work toward will be his own—probably very different from those of other students.

Another concern voiced was that *goals are inflexible, but students change from time to time.* But only arbitrary goals are inflexible. There is little question that objectives defined by teachers or by curriculum materials selected by teachers often do not accommodate student interests. The purpose of student goal setting is not to derive a rigid set of goals and then tell the student, "This is it. Now that you know what you want to do, do it." Goal-setting discussions should frequently be held so the student can assess progress toward any goals, identify problems had in reaching them, and state changes in thinking about them.

Finally, it was assumed that *establishing behavioral objectives would lead to the imposition of activities on students.* But this need occur only if students cannot express their own goals. Students will frequently need and seek guidance in determining which activities will assist them in reaching objectives and in identifying when they have made progress. Objectives need not be used as a means to force teacher-desired activities on students, but, rather, can serve as a source of discussion and as a focal point for teacher guidance in instructing students to select their own activities; the intent is the student's and the teacher becomes the facilitator.

Conclusion

The instruction of teachers on procedures for goal-setting conferences has direct implications for learners and learner-selected programs. The elicited behavioral objectives which result allow learner freedom in setting educational direction while providing direct evidence of the effectiveness of the learner-selected program. Establishing relevant behavioral objectives on an individual basis provides the major step toward comprehensive programming based on learner needs, interests, and responsibilities.

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